# THE IRON TRADE REVIEW

Volume XL CLEVELAND, FEBRUARY 21, 1907 Number 8

## QUIET BUT FIRM.

### PIG IRON MARKET SHOWS A LITTLE IMPROVEMENT.

**Steel Corporation Makes a Purchase.—Southern Production Does Not Increase.—Better Prospect for Railway Contracts.—Large Car Order.**

Indications of a downward tendency in pig iron prices, noted last week, are not now so strong. The position of buyers of steel making iron in insisting upon a $20 quotation is still firmly maintained, although necessity sometimes compels a small purchase. Independent manufacturers of finished products, particularly of sheets, are not buying more crude steel than is absolutely necessary, insisting that they cannot operate profitably unless prices of pig iron and steel decline or quotations on finished products advance. Indications are that general buying of steel making irons for the last half may be delayed several months. Some observers not directly concerned hope to see the price of steel-making irons forced to $20, believing that interests bringing out that quotation would exert their influence against a further decline, thus establishing greater stability.

**Corporation Purchase.** After an absence of many months from the market, the United States Steel Corporation has placed an order aggregating 9,300 tons of low phosphorus pig iron for delivery in June, July and August. The purchase is not of great importance, but is significant as showing that the corporation stacks are needed for ordinary grades and cannot be spared to make the low phosphorus iron which is used in the manufacture of armor plate.

**Southern Conditions.** In the south it is more difficult to obtain iron at $18 Birmingham for the last half, and it is doubtful whether any strictly Birmingham iron can be had at that quotation. Investigations made last week by northern visitors to the south indicate that southern furnaces will not be able to increase their product to any large extent this year. In the central west, a large cast iron interest which has been sounding the market for second quarter delivery has found prices firm and iron far from plentiful. Charcoal furnaces are having no difficulty in disposing of their product at good prices, one company having sold 25,000 tons this year including 10,500 tons to a car building concern.

**Very Heavy Specifications.** In finished lines specifications are being received in very large volume and new business in nearly all products is satisfactory, although some structural mills are anxious to obtain more orders before the spring rush sets in. The one cause for apprehension has been concerning the inability of railroads to finance contemplated large purchases. The fact that the Pennsylvania has been able to sell $60,000,000 in notes and that the New Haven has sold $28,000,000 in bonds in France has made the outlook much more hopeful. The Rock Island and Frisco systems have ordered 10,000 freight cars from the American Car & Foundry Co. for delivery beginning in April.

**Inquiry for Ship Plates.** The first sale of muck bar made in months was for 4,000 tons at $36.60. In addition to the very heavy business already placed, there is an inquiry for shapes and plates for three lake vessels for 1908 delivery. Both specifications and new business in steel and iron bars are very satisfactory. The price of boiler tubes has been advanced $4 on base sizes. Coke is somewhat easier, owing to the blowing out of a number of furnaces for repairs.

## FOUR HUNDRED OVENS

**For By-Product Coke May be Built at Joliet Works.**

(Special Telegram.)

Chicago, Feb. 19.—The erection of 400 by-product coking ovens that will have a daily capacity of 2,400 tons at the Joliet works of the Illinois Steel Co., is being considered by the executive officials of the company. No type of ovens has been agreed upon as yet, nor have the details of the installation been worked out, but should the plant be built and the experiment prove successful, it is officially stated that others of the western mills of the United States Steel Corporation may be similarly equipped.

## EXPORT RAIL BUSINESS.

(Special Telegram.)

New York, Feb. 20.—Export business has been the chief contributor to rail business during the week and the aggregate tonnage announced is the heaviest for some time. The Manila railways have taken 10,000 tons and Bolivia railway interests 6,000 tons, both going to the Lackawanna Steel Co. This concern has also booked 10,000 tons from the Atlantic Coast line and 2,000 tons from the Lehigh Valley. As increased tonnage, the leading interest has taken 17,000 tons for the Monterey, Fresno and Eastern and about 10,000 tons of scattered lots, largely for trolley lines. Inquiries are large, totaling about 100,000 tons.

## BILLS DOOMED.

Washington, D. C., Feb. 20.—There is absolutely no prospect of any anti-injunction legislation at this session of congress. Even the advocates of a measure of this character do not expect to secure a report to the house of any bill in this congress.

Perhaps the most discouraging feature of the situation to the advocates of the anti-injunction legislation is the indifference of the president.

# THE WEEK IN IRON CENTERS.

## PITTSBURG.

### Advance in Boiler Tubes.—New Business in Pig Iron Very Light.

Office of THE IRON TRADE REVIEW, 521 PARK BUILDING, Feb. 20

The quiet condition of the pig iron market during the past two weeks remains unchanged with but very slight inquiry and comparatively few sales, the latter being at prices prevailing since the beginning of the year. The impression prevails that the excitement as far as pig iron is concerned is over, and this is justified by the statement of two of the largest producers in the valley to the effect that with but six weeks of the year gone 75 per cent of the total 1907 pig iron output has been sold, and that there are not to exceed 300,000 tons of steel making iron for last half delivery unsold by valley furnaces, this including both the Bessemer association and independent merchant furnaces. In finished lines there has been nothing unusual during the week under review, new business being light, but specifications against existing obligations in all lines, with a possible exception of rails, have been very heavy. Delivery promises on sheet products, merchant pipe and plates have been extended, and in sheet products particularly the car situation has become more troublesome than at any time during the past six months, making it necessary for producers to hold in warehouses an enormous amount of finished material which, with an adequate supply of the proper kind of cars, would have gone to consumers. There is inquiry in the market for shapes and plates to enter into the construction of three lake vessels for 1908 delivery. Specifications against existing steel bar contracts have been exceedingly heavy, and in some lines consumers of steel bars have been compelled to buy iron bars on account of the very remote delivery promises made by steel bar producers. The situation on coke has been much easier in the past week than for several months past, due to the suspended shipments by several large interests, which have thrown a large coke tonnage on the open market for spot shipment, and prices have fallen off from ten to fifteen cents a ton in consequence.

**Pig Iron.**—There has been no change during the past week, there being but very little inquiry in the market for foundry iron except in small lots for immediate shipment and prices on these lots have ranged from $24 to $25 valley furnace. For last half delivery $21.50 to $22 is quoted and on second quarter delivery $23 to $23.50. Four thousand tons basic pig iron in three lots, two of 1,000 tons and one of 2,000 tons for delivery February to April, were sold at $22 valley furnace, and 2,000 tons basic pig iron for spot February shipment at $22.50 valley; one lot of 1,000 tons second quarter sold at $22.50 valley, and a similar lot for the same delivery at $22. We report 500 tons malleable Bessemer third quarter at $21.50 valley; 800 tons basic, first, second and third quarter, at $23, $22.50 and $21.50 for respective delivery periods. Southern No. 2 foundry is quoted minimum $18.50 Birmingham for last half delivery and one large southern furnace interest is still holding its price of $19. The fact that there remain unsold in the valley for last half delivery not to exceed 300,000 tons steel making iron, and that none of the large interests have covered for last half requirements, is very unusual and speaks well for the strength of the pig iron market during the last six months of the year. On second quarter delivery, we quote as follows:

| | |
|---|---|
| Bessemer Valley | $22.00 to 22.50 |
| Bessemer, Pittsburg | 22.85 to 23.35 |
| No. 1 Foundry, Pittsburg | 23.35 to 23.85 |
| No. 2 Foundry, Pittsburg | 23.85 to 24.35 |
| Gray Forge, Pittsburg | 22.25 to 22.50 |
| Basic, Valley | 22.00 to 22.25 |
| Basic, Pittsburg | 22.85 to 23.10 |

**Ferro-Manganese.**—The ferro-manganese market at the present time is a very unsettled quantity and imported 80 per cent for prompt delivery is quoted $74 to $76 f. o. b. Baltimore, and $69 to $70 delivered Pittsburg for last half delivery. Imported 50 per cent ferro-silicon is quoted $110; 12 per cent, $36; 11 per cent, $35.

**Steel.**—The leading producers of semi-finished material can not be considered factors in the market before July 1, as the unusually heavy demand of their own finishing mills will more than take care of any surplus they might produce and will leave nothing for distribution in the open market. Soft Bessemer billets, 4 x 4 and larger, are quoted $29.50 mill, Pittsburg, with indications of an advance on any contracts made for the latter part of the year. Any quotations made at this time and under present conditions are purely nominal, the leading interest not being in position to quote at all, and refusing to renew existing contracts on expiration. Open-hearth billets are quoted nominally $31 to $32 Pittsburg.

**Skelp.**—The very heavy demand for both iron and steel skelp continues and pipe and tube makers who have not got their own supply are having difficulty in securing material for their requirements. We make the following nominal quotations:

Bessemer, grooved, 1.80c to 1.85c; sheared, 1.75c to 1.80c; basic, grooved, 1.85c to 1.90c; sheared, 1.80c to 1.85c; iron skelp, sheared, 2.15c to 2.25c; grooved, 2c to 2.10c.

**Muck Bar.**—The first transaction in muck bar reported for several months was made during the week under review when 4,000 tons was sold for delivery before July at a figure between $36.50 and $36.75, delivered Pittsburg. There are several good sized inquiries in the market, one of the largest being from the Chicago district, but there is very little to be had and the sale reported was made under conditions not usually met with, and was part scrap bar. All pig metal muck bar is quoted $37.50 to $38, Pittsburg.

**Plates.**—In addition to the already tremendous demand upon plate mills for material on specifications against existing obligations, lake shipyards this week came into the market for quotations on plates and shapes for the construction of three lake ships, not, however, of the large type, as the inquiry for the three ships is only 8,500 tons. The steel car interests are being taken care of as well as it is possible to do so, but are short about 20 per cent of their requirements and other interests are in almost the same position. The leading concern will make no delivery promises whatever and independents cannot do much better than five months and are over half that far behind on specifications, with the exception of one or two eastern mills which are asking premiums for more prompt delivery. Prices are very firm and we quote as follows f. o. b. mills, Pittsburg:

Tank plate ¼-inch thick, 6¼ to 100 inches, 1.70c f. o. b. mill Pittsburg. Light plate schedule, No. 10, 1.80c; Nos. 11-12, 1.85c; Nos. 13-14, 1.90c; Nos. 15-16, 2c. Extras on the regular plate schedule are as follows per 100 pounds: Boiler and flange steel plates 0.10c; A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches, excepting straight taper plates varying not more than four inches in width at ends, narrowest end not being less than 30 inches, 0.10c; complete circles, 0.20c. Plates in width over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches,

0.50c; over 130 inches, 1.00c. Gages under ¼-inch to and including 3-16-inch plates on thin edges, 0.10c; under 3-16 to and including No. 8, 0.15c; under No. 8 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

**Sheets.**—With a very heavy tonnage now under contract and largely specified against, independent interests are anticipating an advance in black sheets, but the leading interest has taken no action. Delivery promises are from 16 to 19 weeks on regular lines but are better than this on specials. Independent producers in position to give better deliveries have had no difficulty in securing from $1.50 to $2.00 premium on their output. We quote as follows, subject to the usual discounts:

Black steel sheets, one pass, cold rolled: Nos. 11-12, 2.20c; Nos. 13-14, 2.25c; Nos. 15-16, 2.30c; Nos. 17-21, 2.35c; Nos. 22-24, 2.40c; Nos. 25-26, 2.45c; No. 27, 2.50; No. 28, 2.60c; No. 29, 2.75c; No. 30, 2.85c; galvanized, Nos. 10-11, 2.65c; Nos. 12-14, 2.75c; Nos. 15-16, 2.85c; Nos. 17-21, 3.00c; Nos. 22-24, 3.15c; Nos. 25-26, 3.35c; No. 27, 3.55c; No. 28, 3.75c; No. 29, 4.00c; No. 30, 4.25c. Corrugated roofing, $1.85 per square for No. 28 painted, 2½-inch corrugation and $3.25 per square No. 28 galvanized, 2½ inch corrugation. Blue annealed sheets, No. 10 and heavier, 1.85c; Nos. 11-12, 1.90c; Nos. 13-14, 1.95c; Nos. 15-16, 2.05c.

**Tin Plate.**—The leading interest has not yet announced its official third quarter price to the general trade, although some business for this delivery has been taken from consumers for whom it is absolutely necessary to cover for this advanced period. The American Sheet & Tin Plate Co. has announced the abandonment of its Star mill in Pittsburg, and ultimate intention to dismantle the property on account of poor location and confined ground space with no facilities for extension and inadequate railway facilities. The property will probably be sold. This mill has been in operation twelve years, and is an eight-mill plant. The modern machinery in its equipment will be moved to other plants as extensions are required, and the remainder will be scrapped. We quote as follows:

Coke tin plate, 100-pound basis, 14 x 20, $3.90 f. o. b. mill, Pittsburg district. Terms, 30 days, less two per cent for cash in 10 days.

**Hoops and Bands.**—There is some little new business, but on account of the present being between contract periods and the fact that in many instances old contracts run through to July, and some until next September, while others expire in April, the new buying has been light. Specifications, however, are heavy and mills are running about even on specifications and shipments. We quote:

Hoops in carload lots, 2c; in less than carload lots, 2.10c; bands, 1.60c base, half extras as per standard steel.

**Rails and Track Material.**—The new rail tonnage continues light and new contracts placed with local mills during the week under review will not aggregate more than 10,000 tons of standard sections and 2,000 tons of light rails. The inquiry has also been light, and not equal to that of the past month. Railroads have been slow in placing for far future deliveries and as a reason quote the close money market, and inability to float bonds for car trusts, to say nothing of further track extensions. Traction roads are also handicapped by inability to dispose of bonds and several large orders are held in abeyance on this account. We quote as follows:

Fifty-pound and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; 8-pound, $40; 12-pound, $36 to $37; 16-pound, $35 to $36; 20-pound, $34 to $35; 25 to 45-pound, $33 to $34; angle splice bars for standard sections, $1.65; spikes for forward deliveries, $2.50.

**Merchant Bars.**—Despite the enormously heavy business that has been done in steel bars during the past few months and the opinion expressed by producers from time to time during that period that the bulk of the business for the year had been placed, new business is still being received. Supplementary orders have been added to originals, and while the week under review has been comparatively light on new business, it has been enough to demonstrate without doubt that there is still considerable business to be placed. The feature of the situation is the heavy specifications that are being placed and the extent to which contracts have been specified for monthly deliveries much farther ahead than is usually the case. Prices are very firm at 1.60c base Pittsburg on steel bars. So far this month, the bar iron business has been confined as far as buying is concerned to railroad interests and to a considerable extent to consumers who usually buy steel, but on account of the extended delivery promises on steel bars, are compelled to buy iron bars. The prices for iron are firm at 1.80c to 1.85c Pittsburg, the former price to large buyers only, and 1.60c to 1.65c base Pittsburg plus freight for western shipment from western mills. We quote:

Common iron bars, 1.80c Pittsburg in carload lots and over, 1.85c in less than carloads; Bessemer steel bars, 1.60c, net; plow and cultivator, 1.60c, net; channels, angles, zees, tees, under three inches, 1.70c, all f. o. b. Pittsburg. The following differentials are maintained on steel: less than 2,000 pounds, 0.10c advance; less than 1,000 pounds of a size 0.30c advance. Cold rolled and ground shafting, 50 per cent off in carload lots, and 5 per cent off in less than carloads, delivered in base territory; open-hearth spring steel, 2.25c to 2.50c, sleigh shoe flats, 1.60c to 1.65c; smooth finished machinery steel, 1.90c to 2c; toe calk, 2.10c to 2.15c. The price of planished and machine straightened tire is 1.80c, base, half tire extras. Iron finished tire up to 1½ inch and over to be sold on regular bar basis of 1.60c base, half extras, steel card.

**Structural Material.**—The new business in structural shapes as far as the mills are concerned is light for material for quick delivery, and they are all in excellent shape to take care of this class of business. Construction companies evidently have no fear of the future, at least as to this year, although all are extremely anxious to accept quick delivery business to tide over until the spring rush begins, and some of them are positively hungry for work to be rushed. These companies during the past week have in several instances placed orders with the mills for anticipated and actual requirements of the year and these orders have been to the extent of practical capacity of their plants with last year as a standard. The mills are not worrying over the immediate situation, because, during the present lull in the demand for structural material and lack of specifications for prompt delivery, other finishing ends are readily absorbing the temporary surplus of semi-finished steel which in the ordinary course of events would go to the structural mills. We continue to quote:

Beams and channels, 15-inch, and under, 1.70c; over 15 in., 1.80c; zees, 1.70c; tees, 1.70c; angles from three to six inches inclusive, 1.70c; over six inches, 1.80c; universal and sheared plates, 6¼ inches and wider, 1.70c base.

**Wire and Wire Nails.**—The heavy specifications continue to pour in upon producers of wire products at an unprecedented rate, and books are now filled practically to the limit of mill capacity for the contract period. Retailers and jobbers are specifying heavily for their spring requirements in anticipation of an unusually heavy demand. Shortage of the proper kind of cars has handicapped shipments to some extent. Prices are very firm and remain unchanged as follows:

Wire nails, jobbers' carload lots, $2; retailers' carload lots, $2.05; less than

carloads, $2.10; painted barb wire, $2.15, for jobbers in carloads; retailers in carloads, $2.20; and less than carloads, $2.30 with 30c for galvanizing; plain wire, $1.85 for jobbers and $1.90 by carload.

**Merchant Pipe.**—There has been no change in this situation; the new business and specifications continue to be overwhelmingly heavy and delivery on ordinary lines is now about four months. The National Tube Co. last week closed with the Southern Pacific interests for 400 miles of line pipe and negotiations are now pending with other interests for smaller tonnages. We quote:

| | Steel black | galv. |
|---|---|---|
| ⅛ to ¼ inch | 66 | 50 |
| ⅜ inch | 68 | 54 |
| ½ inch | 70 | 58 |
| ¾ to 6 inches | 74 | 64 |
| 7 to 12 inches | 69 | 54 |
| EXTRA STRONG PLAIN ENDS. | | |
| ⅛ to ⅜ inch | 59 | 47 |
| ½ to 4 inches | 66 | 54 |
| 4½ to 8 inches | 62 | 50 |
| Double extra strong plain ends, ½ to 8 inches | 55 | 44 |

**Boiler Tubes.**—The leading interest during the past week announced an advance of $4 a ton on the basing sizes 2¾ inches to 5 inches, making a discount to consumers of 65 on steel and 52 on iron. Specifications are very heavy and new business in proportion. We quote as follows:

| Boiler tubes. | Steel | Iron |
|---|---|---|
| 1 to 1¼ inches | 47 | 47 |
| 1¼ to 2¼ inches | 50 | 42 |
| 2½ inches | 61 | 42 |
| 2¾ to 5 inches | 65 | 52 |
| 26 to 13 inches | 50 | 42 |

Less than carloads two points less.
2¼ inches and smaller, over 18 feet, 10 per cent, net, extra.
¾ inches and larger, over 22 feet, 10 per cent, net extra.

**Coke.**—Several large suspensions of shipments on furnace coke has had the effect during the past week of throwing an unusually large lot of spot coke on the market and prices have dropped from ten to fifteen cents a ton. A further weakening influence has been the favorable operating conditions in the coke region, there being practically no rain or snow, and the production has been large. Spot furnace coke is now quoted $3.50 to $3.60, and coke for shipment prior to July 1, $3.25 to $3.30, while coke for shipment during the remainder of the year has not changed, quotation being $3.10 to $3.15. Foundry coke for spot shipment, or delivery prior to July 1, is $3.75 to $3.85, and for shipment during the remainder of the year, foundry coke is quoted $3.65 to $3.75. The announcement by the H. C. Frick Coke Co. of an advance of ten per cent in wages in the coke region to all classes of labor will bring about a corresponding increase by all other operating companies and will mean an additional expenditure for wages alone of about $2,500,000 per year in the whole region. This movement was voluntary on the part of the Frick company, which has always taken the lead in these matters, and has always been followed by other operations in the region. The Fittsburg Coal Co. has announced its intention to enter the coke making business on a more extensive scale than heretofore. It is now operating 1293 ovens, an increase of 564 new ovens during 1906. Extensive new operations by independent companies are now being planned in Green county.

**Old Material.**—The scrap market during the week under review has been dull, but firm, with one or two exceptions, where prices have gone off from 25 to 60 cents a ton. Heavy melting scrap from either a buying or selling standpoint is practically dead, none of the large consumers being in the market and embargoes have been placed on the plants of several of the largest consumers. This situation has developed an unsatisfactory market with practically nothing upon which dealers can operate. For delivery in the Pittsburg district, prompt shipment, we quote:

Heavy melting scrap, $18.50 to $19; re-rolling rails, $21 to $21.50; bundled sheet scrap, $16 to $16.50; iron axles, $30.50 to $31; old iron rail, $24 to $24.50; No. 1 wrought scrap, $19.50 to $20; old car wheels, $23.50 to $24; low phosphorus scrap, $22.50 to $23; machine shop turnings, $15 to $15.50; axle turnings, $15.75 to $16.25; cast borings, $12.50 to $12.75; No. 1 cast scrap, $20 to $21.

## CHICAGO.

### Specifications at Mills Heaviest on Record.—Pig Iron Dull.

Office of THE IRON TRADE REVIEW.
1362 MONADNOCK BLOCK, Feb. 19

The demand for finished material is unabated. Daily sales continually exceed the daily output. Specifications on local mills are the heaviest in history, but instead of overtaking them, producers are steadily falling further behind. Jobbers are having trouble in replenishing their stocks, and, because of the uncertainty of mill shipments, they are forced to the recourse of picking up odd lots wherever obtainable. The only price change is in boiler tubes, which have been advanced two points, on base sizes. Pig iron is without animation. There is neither anxiety to buy nor undue haste to sell. The dullness is especially marked for the last half. Values are unchanged, not enough tonnage having been placed to move the market either upward or downward. Scrap is without improvement, and prices are lower.

**Pig Iron.**—Ten days remain of the month's continuance of the present freight rate between Birmingham and the Ohio river granted by southern railroads. At the time the postponement was announced, it was intimated that a united effort would be made during the following thirty days to move the iron that had accumulated on furnace yards. In the three weeks that have elapsed, there has been no distribution commensurate with the gravity of the situation. Stocks on furnace yards in the Birmingham district are greater today than they were at the opening of the month. The effort of the railroads, if any was made, has been a signal failure. Despite frantic appeals of officials of all the furnaces in the affected district, the supply has been wholly inadequate. Furnaces are not moving their daily output, much less the accumulated tonnage. For ten days past, one producer with a stock of 30,000 tons and a daily output of 1,150 tons reports that it has an average of only one car a day from all the railroads in the district. Another large maker states that for three weeks it has not received a single car from the largest trunk line in the south. Others report that the only cars received were those consigned to them loaded with freight. These are not isolated instances but in one form or another, the car shortage is the substance of every report from the south. Under the circumstances, it is futile to expect early relief from the present congestion. This condition has contributed no small influence towards the maintenance of existing schedules.

Southern No. 2 for the last half still rests at $18.50 Birmingham, despite the array of large producers on the bear side of the market. It is possible in some quarters to secure an $18 price, but it is purely a speculation by the sellers. No change has been made in the quotation for either first or second quarters, which are $23 and $22 Birmingham for No. 2 respectively. The same strength is noted in northern irons.

The local product for the last half is held at a minimum of $23.50 Chicago for No. 2; for earlier deliveries price range from $26.50 to $28.00 Chicago. There is little trading, however, except for spot shipment. The conviction that prices are on the verge of a decline seems widespread and has resulted in an almost total cessation of orders for forward deliveries. Our prices are without change as follows:

| | |
|---|---|
| Lake Superior charcoal | $25.50 to 26.50 |
| Northern Foundry No. 1 | 24.00 to 24.50 |
| Northern Foundry No. 2 | 23.50 to 24.00 |
| Northern Foundry No. 3 | 23.00 to 23.50 |
| Northern Scotch Foundry | 24.00 to 24.50 |
| Ohio Strong Softeners No. 1 | 23.30 to 23.80 |
| Ohio Strong Softeners No. 2 | 22.80 to 23.30 |
| Southern Foundry No. 1 | 22.60 to 23.10 |
| Southern Foundry No. 2 | 22.10 to 22.60 |
| Southern Foundry No. 3 | 21.60 to 22.10 |
| Southern Foundry No. 4 | 21.10 to 21.60 |

| | |
|---|---|
| Southern No. 1 Soft | 22.60 to 23.10 |
| Southern No. 2 Soft | 22.10 to 22.60 |
| Southern Gray Forge | 19.60 to 21.10 |
| Southern Mottled | 19.10 to 19.60 |
| SouthernSilveries 4 per cent to 6 per cent Silicon | 24.60 to 25.10 |
| Jackson Co. Silveries, 8 to 10 per cent Silicon | 29.80 to 30.30 |
| Malleable Bessemer | 23.50 to 24.00 |

**Billets and Rods.**—The movement in crude material is slow because of the very small tonnage local mills have to offer. The largest inquiry pending is from a Kansas City interest which is in the market for 1,500 tons of 4 x 4 billets. Prices are firm but without change. We quote forging billets from $35 to $38 Chicago, according to size, and wire rods, $37 to $38 Pittsburg.

**Iron and Steel Bars.**—Increased activity is noted in bar iron. Prices have strengthened, the local quotation being 1.65c Pittsburg. Western mills have ample specifications on hand, and are asking premiums of $1 to $2 a ton for prompt shipment. Specifications for steel bars show no diminution. The Milwaukee plant of the Illinois Steel Co. has sufficient business on its books to keep it operating to full capacity for the remainder of the year. New tonnage is plentiful, but it is difficult to get the delivery required. We quote for Chicago delivery:

Hard steel angles, 1.75c; soft steel bars and bands, 1.76½c, half extras; soft steel angles less than 3 x 3, 1.86½c; hoops, 2.16½c base, full extras. We quote bar iron from stock 2.25c; full extras; soft steel rounds and squares, 3 inches and larger, $2 per 100 pounds base; flats, 2 inches to 4 inches by 1⅛ inch and larger, $2 per 100 pounds base; 4½ inches x 5 inches and 6 inches x 5-16 inch and thicker, $2 per 100 pounds base; all ovals, half rounds, $2 per 100 pounds base; steel bands, $2, half extras; soft steel hoops, 2.40c to 2.50c, full extras. Other sizes not mentioned above, $2 per 100 pounds base plus half extras.

**Plates.**—Not in years has there been such an insistent demand for plates. Every manufacturer is crowded with specifications, and guaranteed shipment can be had only by the payment of stiff premiums. The leading producer in this section never in its history had such a volume of orders and specifications on hand as at the present time. Promise of shipment on sheared plates cannot be made before August, and on universal sizes new tonnage cannot be had before November or December. Sales constantly exceed output, and months will be required to overtake the delinquent tonnage. Prices are firm as follows:

Plates ¼ inch and thicker 6⅛ to 100 inch wide, either universal or sheared, 1.70c Pittsburg base. For extras, see Pittsburg report. Freight rate to Chicago, 16½c per 100 lbs. Jobbers' price for shipment from local stocks are as follows: Tank steel ¼ inch and heavier up to 72 inches wide, 2.20c; 72 inches up to 96 inches wide, 2.30c; 3-10 inch up to and including 60 inches wide, 2.30c; 3-16 inch 72 inches wide, 2.55c; No. 8 up to 60 inches wide, 2.35c. Flange steel, 25c extra; heads, 25c extra.

**Sheets.**—Mills are crowded with orders and specifications and the best delivery obtainable is eight to ten weeks. Because of their ability to give prompt shipment, considerable tonnage is deflected to jobbers' channels. Prices are uniformly maintained on the basis given below. We quote carload lots, as follows:

Black sheets Nos. 8, 9 and 10, 1.90c Pittsburg; No. 28 gage, 2.60c Pittsburg Galvanized sheets No. 28 gage 3.75c Pittsburg. Freight to Chicago 16½c per 100 pounds. Jobbers' prices on less than carload lots from store are as follows: No. 10, 2.25c to 2.30c; No. 12, 2.30c to 2.35c; No. 14, 2.35c to 2.40; No. 16, 2.45c to 2.50c; Nos 18, 20, 2.70c to 2.80c; Nos. 22, 24, 1.75c to 2.85c; No. 26, 2.80c to 2.90c; No. 27, 2.85c to 2.95c; No. 28, 2.95c to 3.05; No. 30, 3.35c. Galvanized sheets, Nos. 10 to 20, 3.40c to 3.45c; Nos. 22 and 24, 3.55c to 3.60c; No. 26, 3.75c to 3.80c; No. 27, 3.95 to 4c; No. 28, 4.15c to 4.20c; No. 30, 5.35c to 5.40c.

**Structural Steel.**—Material for building operations is moving very slowly. Neither the corn exchange bank, 4,000 to 5,000 tons; the Lehigh Valley coal dock, 2,500 tons; the McCormick building, 2,000 tons, nor the several other large structures on which figures have been invited, are any nearer to closure. Railroad tonnage, however, continues good. The latest inquiry from this source is for 4,000 tons of fabricated material. Prices are without change, as follows:

Beams and channels, 3 to 15 inches inclusive, 1.70c Pittsburg. For extras see Pittsburg report. Freight rate from that city to Chicago is 16½c per 100 pounds. Quotations from store are as follows:

All angles, three inches and larger, including six inches, $2.05 to $2.10 per 100 pounds; angles over six inches, $2.15 per 100 pounds base, beams, three inches to 15 inches, inclusive, $2.05 to $2.10 per 100 pounds base; channels, three inches and larger, $2.05 per 100 pounds base. Less than carload lots are $2 a ton higher than foregoing price.

**Rails and Track Supplies.**—Except that inquiry for rails for 1908 shipment is occasionally made, there is nothing of interest to report. Railroads continue slow in specifying for rail shipments this year, and also in furnishing mills with cars, and the consequence is that the local rolling schedule frequently has to be changed. We quote as follows:

Bessemer rails, $28 to $30; less than 500-ton lots, $32; open-hearth rails, $29; light rails, Bessemer, 30 to 45-pound sections, $33; 25-pound, $34; 20-pound, $35; 16-pound, $36; 12-pound, $37, and lighter sections down to 8-pound, $43.50, all f. o. b. mill. Track supplies vary in price according to quantity and delivery. Angle bars in large lots are quoted 1.65c to 1.75c; for smaller quantities, 2.25c to 2.75c; spikes, large lots, 2.25c; for smaller quantities, 2.50c; bolts, large lots, 2.65c to 2.75c; smaller lots, 2.85c with square nuts, and 3c with hexagon nuts.

**Merchant Steel.**—The offer of additional tonnage by implement manufacturers is frequently made. Mills are so crowded, however, that instances are rare when the accommodation can be granted. Prices are firmly maintained, as follows:

Planished or smooth finished tire steel, 1.96½c; iron finish, up to 1¼ x ½ inch, 1.91½c base; iron finish, 1½ x ½ inch and larger, 1.76½c, base; channels for solid rubber tires, ¾ to 1 inch, 2.26½c, and 1⅛ inch and larger 2.16½c; smooth finished machinery steel, 2.16½c; flat sleigh shoe, 1.81½c; concave and convex sleigh shoe, 2.06½c; cutter shoe, 2.35c; toe calk steel, 2.31½c; railway spring, 1.96½c; crucible tool steel, 6½c to 8c, with higher prices asked on special grades. Shafting is very strong. Quotations are without change at 50 per cent off in car lots and 45 per cent in less than car lots, in base territory.

**Cast Iron Pipe.**—Current orders are largely for lots less than 500 tons, but in the aggregate they make a round tonnage. Prices for Chicago delivery are firm as follows: Four-inch water pipe, $38.60; 6 to 12-inch inclusive, $37.60; 16-inch and upward, $1 a ton less; gas pipe, $1 a ton higher on all sizes.

**Merchant Pipe.**—The congestion on mill books arising from the scarcity of cars is assuming serious proportions. Jobbers' are specifying freely for spring stocks, but shipments are moving forward very slowly. Prices are firmly maintained as follows: ¾ to six inches black steel pipe, 74.35 per cent discount; galvanized, 64.35 per cent discount. From store in small lots, Chicago distributors are asking 72½ per cent discount on the base sizes.

**Boiler Tubes.**—Another advance of two points has been made in tubes.

2¾ to five inches steel, are now quoted 63.35 Chicago; iron, 50.35; seamless, 50.35. Seamless tubes, 2½ inch and 1¾ inch to 2¼ inch, were advanced only one point; no change was made on size one inch to 1½ inch. On less than carload lots from store, we quote 60 off for steel; 47½ for iron, and 47½ for seamless.

**Wire Products.**—The wire situation is without noticeable change. The car and steel shortages continue harrassing factors, delaying deliveries to a considerable extent. No cessation is noted in the volume of business. Prices are without change. We quote to jobbers, Chicago delivery, as follows: Wire nails, $2.15; painted barbed wire, $2.30; galvanized barbed wire $2.60; smooth annealed wire, $2.30; polished staples, $2.30; galvanized staples, $2.55. Carloads lots to retailers, five cents higher; less than carload lots, 15 cents higher.

**Old Material.**—Little change is observed in the scrap situation. If anything, the market is slightly weaker. Mill material is the worst off in this respect because of the generally well filled condition of all consumers. Dealers are gradually unloading their stocks and frequent transfers are reported at very attractive figures for the buyer. The mild weather prevailing and the large offerings by railroads prevent any tendency towards recuperation, and not until spring is further advanced is any improvement expected. No. 1 railroad wrought has sold as low as $15.25 Chicago in the week under review; car wheels have also declined to the basis of $23.00. Old steel rails are also lower by 50 cents a ton. The C. B. & Q. railway has a new list of 4,500 tons out; the C. M. & St. P. list contains substantially 700 tons. We have revised our prices. Gross tons are given in the first paragraph:

| | |
|---|---|
| Old Steel Rails (4 feet and over) | $18.00 to 18.50 |
| Old Steel Rails (less than 4 feet) | 18.00 to 18.50 |
| Old Car Wheels | 23.00 to 23.50 |
| Old Iron Rails | 25.00 to 26.00 |
| Relaying Rails, subject to inspection | 31.00 to 32.00 |
| Frogs, Switches and Guards | 16.50 to 17.00 |
| Heavy Melting Steel | 16.00 to 16.50 |
| Mixed Country Steel | 12.50 to 13.00 |

We quote net tons as follows:

| | |
|---|---|
| No. 1 R. R. Wrought | $15.25 to 15.50 |
| No. 2 R. R. Wrought | 14.25 to 14.50 |
| Shafting | 17.00 to 17.50 |
| Dealers Forge No. 1 | 12.00 to 12.50 |
| Wrought Pipe and Flues | 11.50 to 12.00 |
| No. 1 Cast, 150 pounds and less | 17.50 to 18.00 |
| No. 1 Mill | 10.50 to 11.00 |
| Mixed Busheling (No. 1 & No. 2) | 11.00 to 11.50 |
| Country Sheet | 8.50 to 9.00 |
| No. 1 Boilers Cut | 11.50 to 12.00 |
| Boiler Punchings | 15.00 to 16.00 |
| Iron Car Axles | 26.50 to 27.00 |
| Steel Car Axles | 21.00 to 21.50 |
| Iron Axle Turnings | 11.00 to 11.50 |
| Cast Borings | 8.50 to 9.00 |
| Mixed Borings, etc. | 8.50 to 9.00 |
| Machine Shop Turnings | 11.00 to 11.50 |
| Railroad Malleable | 16.00 to 16.50 |
| Agricultural Malleable | 15.00 to 15.50 |
| Stove Plate and Light Cast Scrap | 14.50 to 15.00 |
| Old Iron Splice Bars | 20.00 to 21.00 |

**Coke.**—Local demand for coke is largely of a spot nature. Contracting for the first half of this year was generally completed last fall, and only in cases where deliveries have been slow is any new tonnage in demand. For spot shipment, 72-hour foundry coke is held at $3.85 to $4.00. Connellsville ovens, and for the first half, $3.75 to $3.85. By-product coke is firm at $6.90 to $7.15 Chicago according to delivery required.

## CLEVELAND.

### Heavy Sales of Charcoal—Inquiry for Second Quarter.

Office of THE IRON TRADE REVIEW. }
BROWNING BUILDING, Feb. 19 }

**Iron Ore.**—Reports from Duluth indicate that, in spite of the cold weather and deep snow, there is great activity in stripping and other operations on the Mesabi range preparatory for heavy shipments next season. Considerable difficulty is being experienced in getting enough labor of a satisfactory kind.

**Pig Iron.**—The most interesting development has been inquiry from some large concerns—especially pipe interests—for from 5,000 to 10,000 tons for second quarter delivery. Iron for this delivery is scarce, and it is doubtful whether a buyer could contract at less than $23 furnace for No. 2. Clevelanders interested in pig iron and cast iron pipe have just returned from a southern trip, which had for its object the investigation of conditions in those two industries. These gentlemen are convinced that it will not be possible to increase to any considerable extent the production of pig iron in the south during the remainder of the year. This is due in part to the very unsatisfactory supply of labor, and in part to the fact that the companies are not able to mine enough ore to meet furnace requirements. In some cases, in both coal and iron mines, where exploring had not been thoroughly done, the results have been very disappointing. As to the cast iron pipe industry, the Cleveland men are of the opinion that in spite of the lower price of pig iron in the south, pipe can be made for shipment throughout a large part of the country as cheaply in Ohio as in Alabama. The advantage of more intelligent and reliable laborers in the north is very decided.

The charcoal iron industry continues to enjoy prosperity. A representative of a leading charcoal iron company, when asked his opinion as to conditions, especially the recent tendency toward lower prices and the financial difficulties of railroads, said: "It has been recognized for some time that the prices for pig iron for prompt delivery were abnormally high, due to some scarcity of pig metal, but more particularly because shippers were unable to get cars fast enough to move the iron that was being called for. It has been fully recognized that as soon as these conditions were removed, prices would settle down to a more normal basis; in fact, furnaces have always been ready to take orders for deliveries the second quarter and last half of the year at lower prices than for prompt shipments. There possibly has been, in some cases, trouble for the buyer and seller to get together on just what reduction should be made from present prices on iron for future delivery. We, however, have not met with such trouble, as we have made sales for the future delivery with about as much facility as for present delivery. We have already sold this month for deliveries extending through the year 25,000 tons of pig iron and have just closed with one of the large car builders for 10,500 tons for the last half. All of our sales are made at the full market price, to-wit, $25.00 at the furnace for the first half and $24.00 for the second half.

"In regard to the difficulties the railroads have experienced in placing their securities: While I think that it is in a measure true that probably much of the projected work will have to be given up on this account, still, I think the purchases for material which they must have if they are to properly handle the freight of the country, will be very large. From every furnace where we are shipping iron we are experiencing continued and persistent trouble in getting cars for loading and in getting them moved promptly when under loads, indicating that all roads are crippled for lack of equipment to handle the freight of the country. So, taking a broad view of the outlook, I see nothing in the situation to give anxiety. On the contrary, there are many indications that business will continue good throughout the year."

We quote f. o. b. Cleveland as follows for last half delivery:

| | |
|---|---|
| Bessemer | $21.00 to 21.50 |
| No. 1 Foundry | 22.00 to 22.50 |
| No. 2 Foundry | 21.50 to 22.00 |
| No. 3 Foundry | 21.00 to 21.50 |
| No. 2 Southern | 21.85 to 23.35 |
| Gray Forge | 20.00 to 20.50 |

**Finished Material.**—The demand for all kinds of finished material continues unabated. There is no indication of a decrease, although there are rumors that the railroads are giving orders to curtail expenses.

**Old Material.**—The market continues to gain in strength, and prospects are becoming more encouraging, though quotations have not been affected except in certain grades. Foundry scrap remains the strongest feature of the market. Turnings are in good demand and a rise of 50 cents is noted in wrought turnings. The mills are urging prompt deliveries by dealers on present contracts, and this is taken as an indication that

the stock is being rapidly consumed and that these plants will soon be in the market. The Nickel Plate Railroad is asking bids on a lot of about 1,000 tons from local dealers. If present open weather conditions continue, their effect undoubtedly will be soon seen in the market.

We have revised our quotations, and quote Cleveland delivery, gross tons, as follows:

| | |
|---|---|
| Old iron rails | $25.00 to 26.00 |
| Old steel rails (over 6 feet) | 18.50 to 19.50 |
| Old steel rails (under 6 feet) | 17.00 to 17.50 |
| Old car wheels | 21.00 to 21.50 |
| Steel boiler plate | 13.50 to 14.00 |
| Steel axles | 21.50 to 22.50 |
| Malleable iron (railroad) | 18.00 to 18.50 |
| Malleable iron (agricultural) | 15.50 to 19.00 |
| Heavy steel | 17.00 to 17.50 |
| Country mixed steel | 14.50 to 15.50 |
| Low phosphorus | 23.00 to 24.00 |

We quote net tons as follows:

| | |
|---|---|
| No. 1 R. R. wrought | $17.00 to 18.00 |
| No. 1 busheling | 14.50 to 15.00 |
| No. 1 machine cast | 18.00 to 18.50 |
| Iron axles | 25.50 to 26.00 |
| Axle turnings | 13.50 to 14.00 |
| Wrought turnings (free from cast) | 12.50 to 13.00 |
| Grate bars | 14.00 to 15.00 |
| Pipes and flues | 13.50 to 14.00 |
| Tank iron | 12.00 to 13.00 |
| Hoop and band iron | 8.50 to 9.00 |
| Sheet iron | 8.00 to 9.00 |
| Wrought drillings | 12.00 to 12.50 |
| Stove plate | 14.00 to 15.00 |
| Cast borings | 9.00 to 9.50 |

## CINCINNATI.

### Pig Iron Market is Dull, But There is Little Evidence of Real Weakness.

February 18.

**Pig Iron.**—There are persistent rumors of $18.00 Birmingham being done on southern iron for the last half of the year. While it is not an open price in this market, it may be said that on a firm offer this figure can be done. It is doubtful, however, whether any strictly Birmingham iron can be had at this quotation. The ruling price for the last half on most southern irons remains at $18.50 Birmingham, and those furnaces which have been asking $19.00 are still holding for that figure. A large melter who has been considering a purchase of a round lot has decided to defer making his purchase at this time. The general run of buyers are pursuing the same policy of deferring order placing and the market rules dull. An inquiry for 2,000 tons of malleable Bessemer, deliveries commencing in March and running to December, is attracting attention, and it is intimated that the order may go to valley furnaces, as there is talk of weakness in prices in that quarter. While all this talk is freely circulated among the trade, it is difficult to locate actual sales at concessions, or to name any particular furnace that is displaying weak feeling.

Spot iron that is actually on track is commanding $23.00 Birmingham, while prompt shipment from furnace yards is obtainable at $22.00. The uncertainty of transportation places the iron on furnace yards at a discount, as against iron actually loaded and in transit. The deliveries on contracts are slightly improved, but are still far in arrears, and the accumulation of iron in the south has not been appreciably reduced. We quote spot iron delivered Cincinnati as basis for settling contracts based on our quotations as follows:

| | |
|---|---|
| Southern foundry No. 1 | $25.50 to 26.50 |
| Southern foundry No. 2 | 25.00 to 26.00 |
| Southern foundry No. 3 | 24.00 to 25.00 |
| Southern foundry No. 4 | 23.00 to 23.50 |
| Southern fdry, No. 1 soft | 25.50 to 26.50 |
| Southern fdry, No. 2 soft | 25.00 to 26.00 |
| Gray forge | 21.50 to 22.00 |
| Northern foundry No. 1 | 26.65 to 27.75 |
| Northern foundry No. 2 | 26.15 to 27.15 |
| Northern foundry No. 3 | 25.65 to 26.65 |
| Jackson County silvery, 8 per cent | 31.15 |

Northern iron in the Ironton district for last half delivery is still quotable at $21.00 to $22.00 at furnace and is well maintained at these prices. In spite of all the bearish arguments and efforts to disturb the steadiness of the market, the general opinion among the selling agencies is that there is ample ground for furnaces to hold to present schedules. It is pointed out that a number of large buyers have not yet covered for the last half and the amount of buying yet to be done will likely absorb the remaining tonnage unsold for the last half of the year. It is admitted that present quotations are yielding the furnaces a liberal profit, that prices are above a normal basis, that a break might result in a rapid decline and that the present market is dull, but the condition of furnace order books, and the probable consumption in sight is regarded by careful observers as sufficient ground to call the market strong as to actual situation. We quote last half delivery, delivered Cincinnati, as follows:

| | |
|---|---|
| Southern Foundry No. 1 | $21.50 to 22.50 |
| Southern Foundry No. 2 | 21.00 to 22.00 |
| Southern Foundry No. 3 | 20.50 to 21.50 |
| Southern Foundry No. 4 | 20.00 to 21.00 |
| Southern Foundry No. 1, soft | 21.50 to 22.50 |
| Southern Foundry No. 2, soft | 21.00 to 22.00 |
| Gray Forge | 19.50 to 20.50 |
| Northern Foundry No. 1 | 22.65 to 23.15 |
| Northern Foundry No. 2 | 22.15 to 22.65 |
| Northern Foundry No. 3 | 21.65 to 22.15 |
| Jackson County Silvery, 8 per cent | 30.15 to 31.15 |

**Finished Material.**—Some lines are firm and jobbers are asking strong quotations, but there is no quotable change in prices for filling small orders here. We quote retail prices as follows:

Angles 3 x 3 and over, 2.15c to 2.25c; beams and channels 15 inches and under, 2.15c; small angles and architectural channels, 2.10c base; plates ¼ inch and heavier, 2c; 3-16 inch, 2.10c; No. 8, 2.10c; sheets (blue annealed) No. 10, 2.15c; No. 12, 2.20c; No. 14, 2.25c; No. 16, 2.35c; box annealed sheets, Nos. 18 and 20, 2.50c; Nos. 22 and 24, 2.60c; Nos. 25 and 26, 2.65c; No. 27, 2.70c; and No. 28, 2.80c. Iron and steel bars, 1.95c base; boiler tubes, 6 per cent off base; turn buckles, 45 per cent off; rivets, 3.15c base; cold rolled shafting, 45 per cent off list; steel tire, 2.10c base.

**Coke.**—There is not much interest in the coke market at this time and trade is confined to a moderate business in spot shipment coke. There is practically no contracting. Prices in the leading coke producing districts are as follows:

| | |
|---|---|
| Wise County, Va. Furnace Coke prompt shipment | $3.25 to 3.50 per ton |
| Wise County, Va. Foundry Coke | 4.00 to 4.50 per ton |
| Pocahontas Furnace Coke prompt shipment | 3.25 to 3.50 per ton |
| Pocahontas Foundry Coke | 3.50 to 4.00 per ton |
| Connellsville Furnace Coke prompt shipment | 3.25 to 3.50 per ton |
| Connellsville Foundry Coke | 4.15 to 4.50 per ton |
| New River Foundry Coke on contracts | 3.50 to 4.00 per ton |
| New River Furnace Coke, prompt shipment | 2.75 to 3.00 per ton |

†Wise County, Va., Coke on Furnace contracts is sold mainly on a sliding scale basis for pig iron prices on the following basis: $1.70 to $1.75 per ton on $9.00 pig iron, plus 19 to 20 per cent of the advance on pig iron above $9.00 Birmingham.

Old Material.—The market is firmer and asking prices are slightly higher for some descriptions. We quote f. o. b. Cincinnati as follows:

| | |
|---|---|
| Old No. 1 railroad wrought, net tons | $17.50 to 18.50 |
| Cast machine and foundry, net tons | 18.50 to 19.00 |
| Old iron rails, gross tons | 25.50 to 26.50 |
| Old steel rails, gross tons | 19.00 to 20.00 |
| Old short lengths, gross tons | 18.00 to 19.00 |
| Old iron axles, net tons | 26.00 to 26.50 |
| Heavy melting scrap, gross ton | 20.00 to 21.00 |
| Stove plate, net tons | 14.50 to 15.00 |
| Wrought turnings, net tons | 12.50 to 13.00 |
| Cast borings, net tons | 9.50 to 10.00 |
| Car wheels, gross tons | 21.50 to 22.00 |

## PHILADELPHIA.

### Pig Iron Market Quiet.—Buyers Disposed to Delay Placing Orders.

February 19.

**Pig Iron.**—The market is quiet, but it can hardly be said that it is dull. A very lively interest indeed is taken in it, as the situation has some peculiar features. During the past week, there has come from the west, and especially from Pittsburg, a great mass of rumors as to an impending break in pig iron prices, the reported intention of the leading steel interests not to buy at present figures, etc., all of which has naturally had a disturbing effect. Whether there is any basis for these stories, or whether they are simply inspired by big consumers with a view to bearing the market is not known here, but it is undeniable that they have had a tendency to restrict buying for the last half of the year. That period is still over four months off, and both consumers and producers feel that there is no necessity to borrow trouble too far ahead. Locally it cannot be said that there are any signs of weakness. There is not much buying for the first half, but that is because there is very little iron to be had outside of the foreign supplies. Prices for prompt shipment have eased up a little, as some insistent small buyers, who have been forced to pay ra-

ther fancy prices for their iron, have preferred to close their plants or trust to getting Middlesboro iron rather than give the figures quoted to them. Many furnaces have not been working well, and there are many complaints of slow deliveries. It is certain that when July 1 ushers in the last half, nearly all producers will still have on their books a large number of unfilled orders taken at first half prices. On the whole it may be said that the market without being weaker, shows less tension. Some slight concessions in prices by some furnaces merely reflect the prevailing uncertainty as to the last half, and especially the last quarter of the year. For the first half $26 for No. 2 X foundry and $24.50 for basic are still about the average quotations, and for the last half prices may be quoted as follows:

| | |
|---|---|
| No. IX Foundry | $26.00 to 26.50 |
| No. 2X Foundry | 23.75 to 24.75 |
| No. 2 Plain | 23.25 to 23.75 |
| Standard Gray Forge | 22.25 to 22.75 |
| Basic | 23.50 to 24.00 |
| Low Phosphorus | 27.00 to 27.50 |

**New Material.**—There has been no notable change in the market, and most satisfactory reports come from the mills, which have orders enough to keep they busy for months to come. Every department shares in the activity. Prices may be quoted as follows: Beams, channels and angles according to specifications, 1.83½c to 2c; refined iron bars, 1.89½c to 1.93½c; steel bars, 1.83½c to 1.88½c; plates, 2.13½c to 2.18½c.

**Old Material.**—The cheaper grades of scrap continue in greatest demand, at advancing prices, but it cannot be said that the market is very active. Buying by the mills is only fair, and prices may be quoted as follows:

| | |
|---|---|
| Old steel rails | $19.50 to 20.00 |
| No. 1 steel scrap | 18.00 to 18.50 |
| Old steel axles | 22.00 to 22 50 |
| Old iron axles | 30 00 to 31.00 |
| Old iron rails | 26.50 to 27.00 |
| Old car wheels | 23.00 to 24.00 |
| Choice scrap, R. R. No. 1 wrought | 20.75 to 21.25 |
| No. 1 yard scrap | 18.75 to 19.25 |
| Machinery scrap | 22.50 to 23.00 |
| Low phosphorus scrap | 22 50 to 23.00 |
| Wrought iron pipe | 16 00 to 16 50 |
| No. 1 forge fire scrap | 16.50 to 17.00 |
| No. 2 forge fire scrap, ordinary | 11.50 to 12.00 |
| Wrought turnings | 16.75 to 17.25 |
| Axle turnings, heavy | 17.25 to 17.75 |
| Cast borings | 14.50 to 15.00 |
| Stove Plates | 16.75 to 17.25 |

## NEW YORK.

### Steel Corporation Purchases Pig Iron.—Steel Companies Will Not Curtail.

Office of THE IRON TRADE REVIEW.
ROOM 1315, No. 150 NASSAU ST., Feb. 19

**Pig Iron.**—The United States Steel Corporation has entered the market and has closed for a total of 9,300 tons of standard low phosphorus iron for delivery equally through June, July and August. Two large eastern producers will supply the iron. The price is not given out. This is the first appearance of the corporation in the market for many months. With this one exception, the local iron situation has been practically featureless during the past week. Eastern melters purchased two lots of foundry iron, of about 2,500 tons each, for delivery running through the second half, and a number of sales of small lots for early shipment are reported, the total of the week's business, exclusive of the corporation deal, being about 10,000 tons. Apparently the spot iron market is slightly easier and quotations which have held for some time can be shaded to some extent. This is in line with the widely prevailing opinion that the spread between spot and future deliveries was unduly large and might be expected to diminish at any time. For the second half, furnaces are extremely firm. New business is light, they admit, but this is only the natural course of procedure on the part of consuming interests which are covered for several months ahead and hesitate about buying for still more remote delivery with prices at the present level. Little attention has been paid so far to the report that, unless there is a material decline in iron, steel makers will curtail operations. Instead if iron continues at its present level, slightly higher prices for those finished products on which the margin is small are expected. We quote tidewater prices, second half delivery, as follows:

| | |
|---|---|
| Northern Foundry No. 1 | $24.00 to 25.00 |
| No. 2 Foundry | 23.50 to 24.50 |
| No. 2 Plain | 23.00 to 24.00 |
| No. 1 Southern Foundry | 22.50 to 23.00 |
| No. 2 Southern Foundry | 22.00 to 23.00 |
| No. 3 Southern Foundry | 21.50 to 22.00 |
| No. 4 Southern Foundry | 21.00 to 22.00 |

**Finished Materials.**—Little change is noted in finished lines. Specifications on old contracts are good and certain products are enjoying considerable activity. In the main, however, new contracts are relatively light, though there is plenty of business in prospect. The week has witnessed the closing of several contracts for railway and building operations involving a fair tonnage. Competition for these orders was brisk, as is to be inferred from the scattered awards, and certain of the larger concerns are making little effort to secure current work, as they declare there can be no profit in them. Export orders for both railway and bridge work are increasing, and structural orders for manufacturing plants are contributing handsomely to present bookings.

The steel work for the addition to the World building, nearly 2,000 tons, will be furnished by the American Bridge Co. This interest has also secured 300 tons for the St. Louis terminal, 400 tons for bridges on the Chicago, Burlington & Quincy, 1,200 tons for the Powelson building, Spokane, almost 1,000 tons for the Schroth building, San Francisco, and 450 tons for the Western Mining building. A considerable tonnage of structural materials for use in connection with the Foreign Railway building is pending. The Pennsylvania railway's requirement of 5,000 tons of bridge material was divided between two eastern interests. Denial is made that reports of curtailed improvements by railroad lines involve anything radical. Inability to secure labor is causing more trouble than the scarcity of capital. Local building operations are extremely light.

The following are prices at tidewater: Angles 3 to 6 inches x ¼ inch and heavier, 1.84½c; beams, 3 to 15 inches, 1.84½c; tees, 3 x ¼ inch and heavier, 1.89½c; plates, carloads, tank, 1.94½c; flange, 1.94½c; marine boiler, 2.14½c; refined iron bars, 1.84½c to 1.89½c; soft steel bars, 1.74½c to 1.84½c; sheets, No. 28 black, 2.60c.

**Old Materials.**—Although mills were active bidders for many items in recent railroad lists, dealers were successful in landing practically all the desirable tonnage at about the same level of prices which has prevailed. Business is well confined to dealing among brokers, and consumers are taking but little. Stove plate is an exception, and is scarce and in demand. We quote, gross tons, tidewater prices, as follows:

| | |
|---|---|
| Old iron rails | $24.00 to 25.00 |
| Old steel rails, long lengths | 19.50 to 20.00 |
| Old steel rails, short pieces | 16.50 to 17.00 |
| Relaying rails | 28.00 to 29.00 |
| Old car wheels | 21.50 to 22.00 |
| Old iron car axles | 28.50 to 29.50 |
| Old steel car axles | 21.00 to 21.50 |
| Heavy melting steel scrap | 16.25 to 16.75 |
| No. 1 railroad wrought scrap | 20.00 to 20.50 |
| Iron track scrap | 17.50 to 18.00 |
| Wrought pipe | 14.50 to 15.00 |
| Cast borings | 11.50 to 12.00 |
| Wrought turnings | 14.50 to 15.00 |
| Heavy Cast Scrap | 18.50 to 19.00 |

## BUFFALO.

### Pig Iron Quiet but Firm.—Buyers Anxious About Deliveries.

February 19.

**Pig Iron.**—The market is reported steady and strong with prices firm with very little selling. In many respects the market bears the same complexion it did last week, but with a more decided uneasiness among the consumers. They are restless in their desire to secure iron for the earliest possible delivery. For a time previous to the first of the year this phase of the market was emphasized, but subsided into more quiet conditions. The uneasiness in this partic-

ular has now manifested itself again. In one instance today a large consumer, who had contracted for a big purchase for last half delivery, urged that the delivery be assured him not later than the third quarter, at the same time offering to pay a substantial advance over the contract price. Several incidents of this character have been reported in the past few days, but local furnaces have not been in a position to make changes in dates of delivery.

Third quarter delivery business is practically closed, all available tonnage being placed and a big hole has been made in fourth quarter.

There is little doubt that the fourth quarter will be sold out within a few weeks. The Buffalo furnace managers look for a firm condition in the market well into the future. They do not predict an advance in prices soon, but they are of the opinion a slight increase is possible, if the demand for early delivery tonnage continues. Just at present the Wall street conditions are closely watched. There is a quiet, therefore, amounting almost to suspense, reinforced by the fact that very few sales are reported, and developments are awaited.

For last half delivery we quote as follows:

| | |
|---|---|
| No. 1 X Foundry | $22.75 to 23.25 |
| No. 2 X Foundry | 22.25 to 22.75 |
| No. 3 Foundry | 21.50 to 22.00 |
| No. 2 Plain | 22.00 to 22.50 |
| Malleable Bessemer | 22.50 to 23.00 |
| Gray Forge | 21.50 to 22.00 |
| Charcoal | 26.00 to 27.00 |

## ST LOUIS.

### Car Situation Worse.—No Buying of Pig Iron for Last Half.

February 18.

**Pig Iron.**—While business has been comparatively light during the week just closed, there has been no further tendency to lower prices for last half. There is still a dollar range on this delivery and this alone would act to hold buyers out of the market did not the people already have doubts about the future. Some of the furnaces adhere to $18.50 for No. 2 Birmingham, but melters have no trouble in placing contracts for round tonnages at $18. Nearly all the buying today is confined to the spot market, which holds firm at $23 for No. 2 southern. There is comparatively little of this to be picked up, because of the tie-up along the railroads and it may be accepted as settled that it will be more than 30 days before the congestion is relieved, if even then. In all, there is about 100,000 tons' accumulation in southern yards. Sloss has 32,000 and the Tennessee-Republic 37,000. Conditions regarding handling the traffic are worse than ever. As an example Sloss was able to get only 12 cars during the first 11 days in February, not nearly enough to handle the current make. There were many empty cars in the yards, but no power to handle them. Other furnaces make the same complaints.

When this reserve is dumped on the market it is realized that there will be no longer be any interesting "spot" market, but there is no reason to make one believe that this period will come soon. There is practically no buying for last half. One house reports a sale of 2,000 tons for this period, but no prices are mentioned. One house booked 1,000 tons of Lake Superior charcoal and a leading car interest has bought 3,500 tons of malleable for second and third quarters.

| | |
|---|---|
| Southern No. 1 | $26.75 to 27.25 |
| Southern No. 2 | 26.25 to 26.75 |
| Southern No. 3 | 25.25 to 26.25 |
| Southern No. 4 | 24.25 to 25.25 |
| Gray Forge | 23.75 to 24.25 |

**Coke.**—Coke is quiet at $4 to $4.50, depending upon delivery.

## BIRMINGHAM, ALA.

### Pig Iron Prices Firm.—Efforts to Increase Supplies of Raw Material.

February 18.

If there are any weak spots in the pig iron market in the southern territory, inquiry at offices of some of the larger companies fails to reveal them. The report that No. 2 foundry iron was selling in this district under $18 per ton could not be verified. Even for delivery at the very last of the year the quotations range above $18 per ton for No. 2 foundry. The usual price is $19 per ton. Iron for second quarter delivery was sought recently in this territory at $21 and a day or two later could not be purchased at $22 per ton. There is very little iron to be had for delivery during the first half of the year.

A casual investigation into the coal and iron development in this district shows that as much attention is now being given in the development in the ore fields as in the coal belt. Red Mountain, between Birmingham and Bessemer, for a distance of twelve miles and more, is being developed extensively. The timber is being cleared off and mining camps are being established. There is evidence on all sides that the iron manufacturing companies in this district, especially some of the larger concerns, are making preparations to increase their raw material supplies. In the coal belt preparations are being made for a larger production of coal while coal washers and new coke attest the intention of increasing the coke supplies. It is asserted that before the end of the coming summer the iron make can be increased at least five per cent. At all places where work is being done about furnaces some attention is being given to the bins in order that the capacities for carrying raw material can be cared for. Instead of from five to ten days' supplies, a fortnight supplies at least will be provided for, if possible.

## BRITISH IRON MARKET

### Prices Decline.—Dabbling in Warrants.—American Influences.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Feb. 6.

Matters are not very cheerful in regard to pig-iron just now. The Cleveland market is suffering more or less from a slump which has brought down prices about 6 shillings from the top figure. Apparently things are steadying a little now. Yesterday's prices at Glasgow were: Cleveland £2-16-8d ($13.86), and £2-16-9d ($13.88) cash, £2-17 (13.94) to £2-17-1½d ($23.97) one month closing £2-18-9d ($13.86); Hematite £3-15-3d ($18.42) paid one month, closing sellers £3-15 ($18.39).

Buyers are still waiting, evidently in the hope of further reductions, but the tendency seems to be rather in the direction of increased strength. A further steamer of 4,500 tons was chartered yesterday for America to load Middlesboro iron. The slump is not easy to explain on any legitimate ground, inasmuch as the shipments last month were 240,000 tons, whilst stocks were reduced 27,000 tons, France, Italy and Belgium all took heavier shipments from the Tees than during the previous month. Yesterday 12,000 tons left Middlesboro nearly half of which was for America. Hematite is very firm, West Cumberland hematite being £3-14-9d ($18.36) one month, cash £3-14-6½d ($18.31). Generally the position is considered more hopeful.

### An Earlier Report.

(Delayed in Transmission.)

January 29.

Interest in the iron trade is at present concentrated upon pig iron, which is in hardly as strong a position as a fortnight ago. The center of the weakness is Cleveland, where last week there was a fall of from 3 shillings to 4 shillings per ton. This was largely due to bear influences, to which the necessary excuse was furnished by rumors of easier conditions in America. The market is wonderfully sensitive to American influences just now, and the news that deliveries have increased in America during the past week, and that foundry iron had fallen $1 to $1.50 below recent prices,

had a decided influence on the market, but it is noteworthy that a recovery of 9d took place at the beginning of this week, and it is now clear that pig iron prices are really less dependent upon American conditions than has been commonly supposed. At the same time it is agreed that the market is not in a healthy condition. This is partly due to the dabbling in warrants by public speculators whose ignorance of iron conditions makes them ready victims to panic on the first alarm.

The only official advance declared on Thursday in finished iron was that of 10 shillings per ton in galvanized sheets, which brings the standard to £13-15-0d. But it is notorious that iron is now selling at over £14, so that a still higher increase would have been justifiable, though not considered quite prudent.

## Metal Market

### CHICAGO.

February 20.

Several changes occurred in metals this week. Copper gained fractionally; sheet zinc was advanved $2 a ton and pig tin fell off half a point. Copper is held at 26¾c for casting and 27c for lake. Pig tin is now quoted at 44½c. Revised price on sheet zinc is 8.50c La Salle in car lots of 600-pound casks. Spelter is quoted at 6.90c. Other metals showed no change. Lead, desilverized, sold at 6.50c to 6.60c for fifty-ton lots, and corroding at 7.25c to 7.35c. Carload lots, 2¼c per 100 pounds higher. Cookson's antimony, 28½c; other grades, 26½c.

In sympathy with iron and steel scrap, the old metal market is inactive and inclined to weakness. We quote dealers' buying prices, as follows:

Copper wire, 20¾c; heavy copper, 20¼c; copper bottoms, 19½c; copper clips, 19¾c; red brass, 19½c; red brass borings, 16¼c; yellow brass, 16c; yellow brass borings, 14¼c; light bras, 12¾c; lead pipe, 5.50c; tea lead, 5c; zinc, 5c; pewter No. 1, 28c; tin foil, 34c; block tin pipe, 27¾c.

### NEW YORK.

February 19.

**Copper.**—The market is only fairly active, with the undertone slightly easier. The leading interest is reported to have booked some orders for May and June electrolytic on the basis of 25c and for still more future delivery at a price slightly below this figure. Spot business is extremely light. For spot lake copper 25¼c is quoted, for futures 25c to 25¼c, for spot electrolytic 25c and for future electrolytic 24⅞c to 25c. London closed yesterday at £114. Exports since Feb. 1 have totalled 4,675 tons.

**Pig Tin.**—An active demand for small lots has instilled some strength into the local market. Yesterday's sales were at prices ranging from 42c to 42½c for spot. May and June deliveries are quoted slightly lower. February receipts have been in excess of 1,850 tons, and about 3,400 tons are afloat. Spot tin closed yesterday on the London market at £191 15s.

**Pig Lead.**—The demand is moderate with spot held at 6.25c. Soft Missouri brands are quoted at 6.10c spot. Soft Spanish closed yesterday on the London market at £19 10s.

**Spelter.**—Refined metal is firm at 6.80c to 6.85c spot. St. Louis quotes 6.75c to 6.80c, according to delivery. London closed yesterday at £26 2s 6d.

**Antimony.**—Cookson's is quoted at 24½c to 25½c for spot, Hallett's at 23½c to 24c and ordinary brands at 23c to 23½c.

### ST. LOUIS.

February 19.

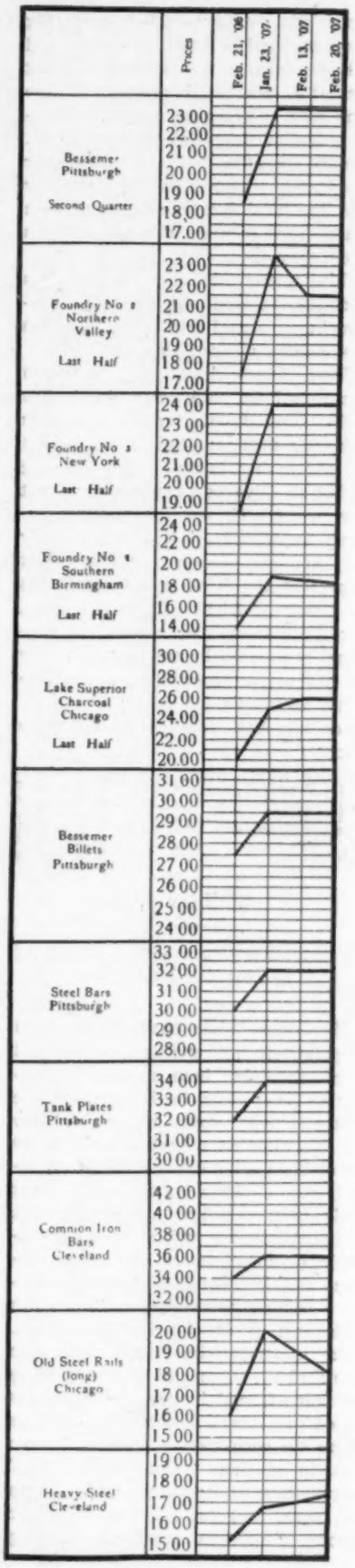
Lead steady $6.10 for Missouri and $6.20 for non-corroding. Spelter is easier at $6.75. Owing to favorable weather conditions there was a heavy output of both zinc and lead ore in the Missouri-Kansas field, with the result that both suffered a slight decline.

### COKE WAGES RAISED.

The H. C. Frick Coke Co., on Monday of this week announced a general advance of ten per cent to all of its employes in the Connellsville region and this advance will be followed by all independent operations in the region and in the course of a year will amount to at least $2,500,000. The raise by the Frick company, is effective March 1 and 18,500 men will receive the benefit of it.

**Plant is Sold.**—The Howe-Brown plant of the Crucible Steel Co. of America, at Pittsburg, was sold at public auction Monday, Feb. 18, by W. W. Wishart, master under direction of the court. This sale was made necessary by suit for partition by minority of stockholders of the Howe-Brown Co., Ltd., one of the constituent companies of the Crucible Steel Co. of America, and the sale, which resulted in the acquiring of the plant by the Crucible Steel Co. of America, simply eliminates the minority stockholders who have controlled about one-sixth of the holding. The price paid at the sale was $945,200. The appraised value of the plant was $1,025,000.

PRICE CHART.



## BEST YEAR

### In History Enjoyed by American Iron & Steel Mfg. Co. in 1906.

In the seventh annual report of the American Iron & Steel Mfg. Co., Lebanon, Pa., for the year ending Dec. 31, 1906, President J. H. Sternbergh of the board of directors states that the business of the past year far surpassed in tonnage and value that of any year in the company's history. During the year the sum of $167,901.06 was spent in improving the plant, mainly for new buildings and new machinery, and the reserve to provide for depreciation was increased $65,500. The financial statement shows assets of $7,528,949.65, of which $3,163,089.34 is in current assets and $4,365,860.31 in fixed assets. The current liabilities amounted to $360,729.85, the fixed liabilities $5,550,000 and the undivided profits $1,618,219.80. The usual dividends on preferred and common stock have been paid. The directors for 1907 include: Arthur Brock, chairman; Edward Bailey, Horace Brock, Edward R. Coleman, Thomas Evans, W. C. Freeman, H. H. Light, James Lord, H. M. M. Richards, J. H. Sternbergh and H. M. Sternbergh. The executive officers are James Lord, president; John Penn Brock, vice president; H. M. M. Richards, treasurer, and C. M. Hallman, secretary.

**A. S. M. E. Meetings.**—The regular spring meeting of the American Society of Mechanical Engineers will be held at Indianapolis May 28 to 31. J. R. Wittemore is chairman of the local committee. At the regular March meeting of the American Society of Mechanical Engineers, vice president John W. Lieb Jr. will deliver an address on "Vesuvius and Pompeii." The lecture will be illustrated by slides imported for the lecture.

## FACILITIES INCREASED

### By the Pressed Steel Car Co. at a Large Cost During Past Year.

"The gross sales of your company for the year ending Dec. 31, 1906, were $36,158,586.47, and the net profits were $3,381,884.18," says President F. N. Hoffstot in his statement to the stockholders of the Pressed Steel Car Co., supplementing the annual report of the company. "These net profits are, after making liberal charges, on account of renewals, upkeep of plant and machinery. This amount of net profits represents the result of the operation of your company's plants, except the sum of $225,000, which was a dividend received from the Pennsylvania Car Wheel Co., one of the subsidiary companies, the entire capital stock of which is owned by your company. The full operation of your company's subsidiary companies during the past year required the employment of their working capital as well as their earnings; therefore no dividends have been declared by such subsidiary companies, with the exception mentioned above, and all net profit earned by each company has been added to its working capital.

"During the year regular dividends of 7 per cent have been paid upon the preferred stock, and there has been charged against properties and franchises by way of depreciation the sum of $350,000, and there has been added to working capital $2,156,884.

"No dividends have been paid in the past year on the common stock of your company, for the reason that it was deemed improvident by the board of directors so to do, in view of the large amount spent during the year on improvements, and for the further reason of taking care of the increased volume of business on hand and anticipated.

PRESSED STEEL CAR CO. STATEMENT.

ASSETS.

| | |
|---|---|
| Properties and ... January 1, 1906 | $25,818,622 27 |
| Additions and betterments during 1906 | 1,384,470 96 |
| Securities—Stocks owned | 2,488,553 62 |
| Taxes and Insurance not accrued | 49,402 48 |
| Accounts Receivable | 1,973,047 87 |
| Stock of Materials on hand | 4,979,815 57 |
| Cash in Banks | 2,065,578 59 |
| Total | $38,759,491 36 |
| Less Depreciation charged off at close of year 1906 | 350,000 00 |
| Balance | $38,409,491 36 |

LIABILITIES.

| | |
|---|---|
| Capital Stock—Common | $12,500,000 00 |
| Capital Stock—Preferred | 12,500,000 00 |
| Five Per Cent First Mortgage Gold Notes payable $500,000 annually | 2,500,000 00 |
| Purchase Money Mortgage—McKees Rocks Plant, 4 per cent | 235,000 00 |
| Purchase Money Mortgage—Allegheny Plant, 4 per cent | 75,000 00 |
| Accounts Payable | 3,762,769 12 |
| Bills Payable | 1,618,350 00 |
| Accrued Salaries and Wages | 201,763 28 |
| Accrued Interest | 52,199 63 |
| Accrued Preferred Dividends | 218,750 00 |
| Surplus—January 1, 1906 | 2,588,775 15 |
| Profits for year 1906 | 3,381,884 18 |
| Total | $39,634,491 36 |
| Deduct Depreciation and Renewals | 350,000 00 |
| Deduct Dividends on Preferred Stock | 875,000 00 |
| Balance | $38,409,491 36 |

"The improvements authorized and begun in 1905 were completed in the fall of 1906, and since that time your company has enjoyed the advantage of additional facilities provided by those improvements. The greater part of the money necessary for such improvements was spent at the McKees Rocks plant in building a steel passenger car works and in increasing the freight car capacity of that plant to the extent of 50 per cent. The balance of the money expended in improvements was used at the Allegheny works in enlarging the paint shop, building a shop for the construction of tank cars, and the increasing of the power and re-arranging thereof so as to provide more continuous operation of this works. All these improvements, besides increasing the capacity, have been made looking persistently to the reducing of the cost of production at each plant.

"The operation of the steel passenger car shop did not contribute to your company's earnings, for the reason that education of men in a new line of industry is expensive and tedious, and full output of work can not be secured by reason of the unfamiliarity of the workmen with the work; but we have gone far enough into this construction to know that as a result of the operations to date, we can produce a first-class fireproof passenger car with only a slight increase in weight over the present wooden type, but at an increased cost.

"The question as to how great will be the pecuniary benefit to accrue to your company from this department must be left to the future, as the railroads at the present time, when there is an urgent demand for better service and the various state legislatures are insisting on lower rates, naturally show hesitancy in doing anything that will increase the cost of their equipment. Our experience convinces us that until there has been a much larger business presented, the cost cannot be substantially reduced. Your company, by reason of its being a pioneer in the field, is necessarily to the front rank in this development, and so is prepared to furnish this fireproof passenger equipment whenever it can be sold at a reasonable profit."

The financial statement of the company for the year ending Dec. 31, 1906, is shown in the accompanying table.

Plans for the new shops of the Hocking Valley railway to be located at Logan, O., are being prepared by the new superintendent of motive power of the company, G. J. De Vilbiss. The company decided to erect these shops at Logan upon the citizens of the town agreeing to donate 50 acres of land to be used partly for the shops and partly in increasing the local yards.

# THE IRON TRADE REVIEW

**Devoted to Iron and Steel Manufacture and to the Machinery, Metal-Working and Foundry Trades.**

PUBLISHED EVERY THURSDAY BY
THE PENTON PUBLISHING CO.
CLEVELAND

BOSTON DULUTH
CHICAGO NEW YORK
CINCINNATI PHILADELPHIA
PITTSBURG
BIRMINGHAM, ENG.

Subscription, $3.00 per annum. To Foreign Countries, $4.50. Advertising Rates Furnished on Application.

Change of advertising copy must reach this office ten days preceding date of publication.

The Cleveland News Co., will supply THE IRON TRADE REVIEW through the regular channels of the American News Co.

European Agents: The International News Company, Breams Building, Chancery Lane, London, E. C., England.

ENTERED AT THE POST OFFICE AT CLEVELAND, AS SECOND CLASS MATTER.

*PRINTED IN AN OPEN SHOP*

February 21, 1907.


## A VITALLY IMPORTANT MATTER.

The movement under the leadership of Messrs. T. Peyton Giles and John Donnan, of Richmond, Va., looking toward a quicker movement of freight by the railroads, has reached the stage of a call for a national convention. Invitations have just been issued to some 200 of the many who have expressed interest in the movement, largely officials or manufacturers', jobbers' and shippers' organizations, to attend a meeting at the Jefferson Hotel, Richmond, Va., on March 7, to form a national association.

If the proposed association carries on the project on the lines laid down by the original sponsors, it will look to congressional enactment of a law fixing maximum times for the delivery of freight, proportionate to distance traveled, and authorizing deductions from the freight bill of percentages proportionate to the excess, in cases where the elapsed time has exceeded the prescribed limit. Provision is contemplated whereby, in cases of providential or unavoidable delay, the railroads may secure exemption from penalty by giving notice to both shipper and consignee, with adequate details of the cause and character of the delay.

This is a subject of vital importance to the railroads, and indeed, to the entire business world. It is admitted by all that the railroads have been simply overwhelmed with freight during recent months. The question is, how can this condition of affairs be prevented in the future? The ablest advocate of the railroads, *The Financial Chronicle*, in a very long editorial on the subject, "Have Our Railroad Managers Been Negligent?", asserts that the situation has been literally such that human foresight and human planning could not provide for it; that the railroads have not been lacking in such foresight as could reasonably have been demanded, as evidenced by the increasing of equipment in the eight years from 1897 to 1905 by almost 50 per cent, and by the increasing of trackage in the same period by the addition of nearly 65,000 miles; that every portion of the tremendous increase in earnings amounting to $1,325,000,000 in 10 years represents additional traffic; that at a time when there was more need than ever before for the railroads to add to their facilities, including motive power, cars, tracks, yards and other facilities, they were suddenly shorn of a large part of their borrowing capacity, so that all through 1906 it was almost impossible to float new bond issues on any reasonable terms, the situation in that respect finally becoming so bad that this year the railroads quite generally were forced to resort to the old time device of issuing short term notes on rather onerous terms; that the charge that the railroads are controlled by plutocrats who give their time to furthering stock exchange speculation instead of developing the properties under their care, is untrue, although there was a time in the history of our railroads when Wall Street manipulation counted for more than good management of the properties; that in recent years the so-called plutocrats who have made fortunes out of the railroads have done so through raising the physical and financial status of these properties by introducing economies in operation and improving the income in other ways; that such men as Hill, Harriman, Cassatt, Morgan and Spencer have been among the world's greatest business men, and that the charges that minor railroad officials have been improperly influenced by gifts of stock and otherwise have been greatly exaggerated.

We believe that there is much truth in what *The Chronicle* says, but also that the railroads can justly be severely criticised in many respects, and especially in not paying better wages to thousands of employes, to whose care countless lives and many millions of dollars' worth of property are entrusted. The railroads have leaned strongly to the spectacular, and the purchase of brains makes a poorer showing for a time than do other expenditures.

Naturally, this Richmond movement is meeting with opposition, and there is a disposition to question the representativeness of the figures compiled by Mr. Giles which showed from a moderate number of cases, selected at random, but all covering freight originating at Richmond, Va., an average elapsed time of shipments, from time of loading to time of delivery, of 63.80 miles per day in 1903 and 61.61 miles per day in 1906. If there is anything wrong with these figures, it is that they show a progress more rapid than the average of all the freight moved over the railroads of the country. This is not intended for a statistical article, and it is amply sufficient to cite what must be accepted as more than a confirmation of the Giles data. Using round figures only, it can be said that the ton miles of freight moved by the railroads in a year are 200,000,000,000 and the number of freight cars used 2,000,000, which gives a ton mileage per car of 100,000. At 20 tons to the car, this is a car mileage per year of 5,000 miles, or an average of less than 15 miles per car per 24 hours! Either, then, Mr. Giles' figures are entirely too favorable to the railroads, or the railroads are wasting an unconscionable amount of time and facilities through delays to unloaded cars.

The picture of American industry being seriously embarrassed in a time of unparalleled expansion is a very serious one. The railroads have been responsible to a very large extent for making the iron trade the prince or pauper industry which it has been by buying in times of prosperity only, rather than preparing in periods of depression for the great demands of prosperity. Even when the buying of material was far from sufficient to meet probable demands, and

when the wages of employes were shamefully poor, the railroads have not hesitated in spending large amounts of money in spectacular performances. Tens of thousands of passengers and employes have been killed and maimed in response to an alleged demand for fast trains. The advertising value of lightning expresses has been considered more important than to make an earnest endeavor to satisfy the whole business community, which ships freight every day, paying the railroads three-fourths of their total earnings.

For a time, in this country, the railroads were too free from criticism, and were allowed to manage their own business about as they pleased. In the past year or two, however, sentiment against the railroads has been very strong, and there is some danger that the hostility felt by the people may result in seriously crippling this great transportation industry. It is a time for thoughtful men, including representatives of the railroads, shippers, and passengers, to get together in a spirit of fair-mindedness, and see if something can not be done to better conditions from which all are suffering. If conducted in the proper spirit the Richmond movement may result in much good.

## A BRITISH COMPLAINT.

Our Birmingham, Eng., correspondent sends us a number of clippings from British newspapers complaining bitterly concerning inaccurate reports of conditions of the American iron market recently circulated in the United Kingdom. It is asserted that deliberate misrepresentations are being made with the object of bringing down the price on iron in the interest of the American buyers. Our British friends will do well to take with large chunks of salt reports emanating from Wall street, and from some American newspapers. Even the trade journals may err at times, but we believe there are no publications in the world which expend more time, energy and money than do the iron publications of the United States in ascertaining with the greatest possible accuracy the real conditions of the market, and that American buyers and sellers are not less truthful than those of other countries in giving information to trade papers.

## GREAT BENEFITS

### Which Would Result From Passage of Shipping Bills.—Mr. Chamberlain's Estimates.

Certain calculations made in a recent interview by Eugene Tyler Chamberlain, commissioner of navigation, will be examined with great interest by all steel makers and ship builders. The subtraction of the cargo feature from the shipping bill seems to have given rise to the impression that the measure as now drawn is of slight interest to shipbuilding and its allied industries, on the assumption that the lines provided for in the bill may be maintained by vessels already in existence. Commissioner Chamberlain proves that this impression is wholly erroneous. Mr. Chamberlain has figured that the full equipment of the mail steamship lines, provided by the bill, would involve the expenditure of more than $32,000,000 in the construction of approximately 26 vessels, ranging from 6,000 to 12,000 gross tons each. These 26 vessels would give a fortnightly service. They would aggregate 216,000 tons, which at an average cost of $150 per ton means $32,400,000. Even should it be decided to execute the service on a monthly basis, approximately one-half of this expenditure would be required.

The proposed line from ports on the Atlantic coast to Brazil of 16-knot vessels, receiving a subvention of $600,000 per annum, according to Mr. Chamberlain would require five ships of 8,000 tons each, or an aggregate of 40,000 tons.

The line from Atlantic coast ports to the Argentine, employing 16-knot vessels and receiving a subvention of $800,000 per annum, would require six vessels of 8,000 tons each, or an aggregate of 48,000 tons.

The line from ports on the Pacific coast to Peru, Chili, by 16-knot vessels at a compensation of $600,000 per annum would require six new vessels of 6,000 tons each, or 36,000 tons. The line from Facific coast ports to the Orient, touching at Hawaii, Japan, China and the Philippines and employing 16-knot vessels, receiving an annual compensation of $700,000, would require not less than six 10,000-ton ships, or an aggregate of 60,000 tons. Contrary to general belief, there are no vessels on the Pacific coast available for this service. It is doubtful if any of the present vessels come within the requirement of a sustained sea speed of 16 knots.

Commissioner Chamberlain estimates that the construction of a vessel of 8,000 tons would be needed to complete a service once in three weeks to the Samoan Islands.

Mr. Chamberlain's conclusions are therefore summarized as follows:

| Service. | Vessels. | Individual Tonnage. | Aggregate Tonnage. |
|---|---|---|---|
| Brazil | 5 | 8,000 | 40,000 |
| Argentina | 6 | 8,000 | 48,000 |
| Panama | .... | .... | ..... |
| Peru and Chili | 6 | 6,000 | 36,000 |
| Orient via. Hawaii | 2 | 12,000 | 24,000 |
| Orient direct | 6 | 10,000 | 60,000 |
| Australasia | 1 | 8,000 | 8,000 |
| Totals | 26 | ..... | 216,000 |

## STEEL DISPLAYS

### Form a Prominent Feature of the Cleveland Automobile Show.

The automobile show being held in Cleveland this week, Feb. 18-23 is the most pretentious and elegant display so far attempted by the local automobile interests. The finished cars and automobile fixtures are shown to the usual advantage and occupied greatest prominence in the exhibit, but a significant feature of the show is the increased display of such products as are supplied by makers of various steels, plates and castings. Very clearly is evidenced the enlarging field for producers of these materials in the growth of the automobile business. Among the people represented at the Cleveland show are the Bassett-Presley Co., seller of all kinds of sheet steel, steel bars, billets and tin plate, all of which it shows to advantage, the Avery Stamping Co., displaying a line of pressed metal and steel plate products for a variety of uses, which it is in the market to supply. J. M. & L. A. Osborn also are showing a line of material for automobile construction, the Standard Welding Co. displays by a number of examples of its facilities for handling all sorts of steel and brass welding and the Ferro Machine & Foundry Co. calls attention to the new auto marine engine designed in its factory and of which it is now making a specialty.

**Had Good Year.**—The annual report of the Union Switch & Signal Co., Swissvale, Pa., shows that the gross earnings for the year, ending Dec. 31, 1906, aggregated $5,065,675. which, after payment of $4,010,343 in aggregate expense, left a net profit of $1,055,332. Official announcement is made that the company will offer 5,000 shares of the common stock to stockholders for subscription, pro rata, to holdings at close of business March 2, 1907, at the rate of $80 a share. Each stockholder is entitled to subscribe for one new share to each nine held. The subscription of the new stock issue is to provide for the rapidly growing business of the company.

## OLD TIME ORE MINE.

### Passes by Option to Bethlehem Steel Co.—Significance of the Transaction.

An interesting development of the past week is the announcement that the Bethlehem Steel Co. has acquired control of the iron ore mines of the Boyertown Ore Co., not far from Pottstown, Pa. It was reported that Charles M. Schwab, representing the Bethlehem company, had agreed to pay between $400,000 and $500,000 for the property, but it is understood that this amount is grossly exaggerated, and that the deal is really a combination lease and sale, by which the Bethlehem company secures the output of the mines for a year, with the option of purchasing them at a reasonable figure if the ore proves satisfactory.

The transaction is of more than usual interest because it was from these Boyertown mines that ore was supplied to the first blast furnace built in Pennsylvania, the old Colebrookdale furnace, erected in 1720, about three-quarters of a mile from Boyertown, and whose site is still plainly marked by a cinder bank. It flourished in colonial and Revolutionary days, but was razed many years ago. Since then the ores have been used in furnaces at Pottstown, Reading and other places, but the output recently has been trifling, and the mines have been practically abandoned. The ore is a hard hematite, with a rather large percentage of sulphur, and is taken out through a shaft which has been sunk to a depth of 660 feet. In order to work the mines in a thoroughly economical manner it will be necessary for the Bethlehem Steel Co. to install more powerful pumps and modern mining machinery, drills, etc. This return to a mine nearly 200 years old, but still believed to contain a large amount of ore, is understood to be due to the steadily increasing cost of Lake Superior ore, the freight rate on which for a haul of some 400 miles from Buffalo is also an important item. Eastern Pennsylvania is full of ore mines which 30 or 40 years ago netted large fortunes for their owners, and it is believed that if lake ores continue to increase in cost many of these will be worked again for the benefit of blast furnaces in the Lehigh and Schuylkill valleys.

**Breaks Record.**—The rail mill of the Algoma Steel Co., Ltd., Sault Ste. Marie, Ont., made a new record in the month of January, when it turned out 19,281 tons of 80-pound steel rails. This is the largest output ever attained by the plant in such a period.

## PHILADELPHIA ENTERTAINERS.

Thos. Devlin, president of the Philadelphia Foundrymen's Association, has appointed the committee which will provide the entertainment during the convention of the American Foundrymen's Association which will be held in Philadelphia, May 20 to 24. It is made up as follows:

E. E. Brown, E. E. Brown & Co.
A. E. Outerbridge Jr., Wm. Sellers & Co.
S. G. Flagg Jr., S. G. Flagg & Co.
C. W. Asbury, Enterprise Mfg. Co.
J. M. Jaycox, Ernest Law & Co.
W. S. Hallowell, Harrison S. B. Works.
Geo. C. Davies, Pilling & Crane.
W. O. Steele, Bateman Mfg. Co.
Geo. R. Sullivan, Rogers, Brown & Co.
E. H. Mumford, E. H. Mumford Co.
Thos. Evans, Eynon-Evans Mfg. Co.
Edgar S. Cook, Warwick Iron Co.
J. H. Sheeler, Sheeler-Hemsher Co.
Cyrus Borgner, Cyrus Borgner Co.
A. A. Miller, *The Iron Age.*
W. H. Ridgway, C. Ridgway & Sons Co.
W. W. Hearne, Matthew Addy Co.
J. Thompson, J. Thompson & Co.
Frank Krug, Jos. Dixon Crucible Co.
Wm. H. Taylor, Geo. V. Cresson Co.
A. C. Mott, Abram Cox Stove Co.
Franklin L. Sheppard, I. A. Sheppard & Co.
Harry W. Hand, Wm. Cramp & Son Ship & Engine Building Co.
John Glover, Glover Bros.
Jas. S. Stirling, Hilles & Jones Co.
H. L. Haldeman, Pulaski Iron Co.
Walter Wood, R. D. Wood & Co.
W. F. Sauter, Williamson Bros. Co.
H. L. Tripple, Fairbanks Co.
Thos. Devlin, Thos. Devlin Mfg. Co.
Howard Evans, J. W. Paxson Co.

## OBITUARY.

Leon Serpollet, a French engineer noted as an expert on boiler tubes, died Feb. 11 at Paris at the age of forty-eight.

Joseph Breaz, aged 47 years, superintendent of the Bessemer department of the Cambria Steel Co. and identified with the early growth of that concern, died in Johnstown, Pa., Feb. 4, following an operation for appendicitis. He leaves a wife and one son.

Nathaniel Dyment, a millionaire lumberman of Barrie, Ont., died on Feb. 4, aged 74 years. He was of English birth but came to Canada when quite young. He had very extensive lumbering interests in Simcoe, Algoma, and Nuskoka, but was also prominent in other branches of industry as president of the Dyment Foundry Co., of Barrie and as a director of the Collingwood Ship Building Co., and the Goderich Elevator Co.

James McKinney, head of the architectural iron works of James McKinney & Son, Albany, N. Y., died Feb. 11 at his home in that city. He was born in 1825 and had engaged in the same line of manufacturing for a half century. In 1857 his business was started under the name of McKinney & Mann, and ten years later his partner, Abraham Mann, retired. Mr. McKinney then continued the work alone, in 1884 admitting his son, Edward, to the firm. He was noted as a generous employer.

## CORE ROOM PRACTICE

### And Other Subjects Discussed by New England Foundrymen.

The monthly meeting of the New England Foundrymen's Association was held at the Exchange Club, Boston, Wednesday, Feb. 13. The committee appointed at the January meeting to investigate the tariff on southern iron reported that it had entered a protest with the interstate commerce commission, but up to that time had received no reply. Advices were received from the railroad companies, however, that the advance scheduled to take effect Feb. 1 had been deferred to March 3. The committee further reported that it had taken this matter up with various foundrymen's associations, urging their co-operation in this movement.

After dinner the chairman introduced Henry M. Lane, of Cleveland, who gave a very interesting talk on "Foundry Mettallurgy, illustrated by the stereopticon.

Geo. H. Wadsworth, of the Falls Rivet & Machine Co., Cuyahoga Falls, O., in a paper on "Core Room Practice, Past and Present," pointed out the rapid advancement made in core room practice in recent years.

Mr. Wadsworth had a number of machines on display and made a seven-inch core 24 inches long in a fraction of a minute. He also showed the company's speed changing machine, which has a slip gear which permits of a change of speed for the making of large and small cores. Another machine was shown which made slab cores in sizes from ⅝ inch x 4 inches and 24 inches long, to 1½ inches by 9 inches by 24 inches long. The multiple machine exhibit made six 1-inch round cores at a time. This machine, he stated, was designed to make knob cores 0.298 of an inch square and he was allowed a variation of 0.002 of an inch; that is, 0.001 under and 0.001 over size.

Considerable interest was manifested in the exhibition by the members, and a vote of thanks was extended to both speakers.

**Gets Big Contract.**—The contract for the iron and steel work to be used in the construction of two blast furnaces by the Youngstown Sheet & Tube Co., Youngstown, has been let to the Variety Iron Works, Cleveland. The contract price is in the neighborhood of a half million dollars. The plans for the furnaces were prepared by Julian Kennedy, Pittsburg, and they will be in blast Jan. 1, 1908. The Variety Iron Works has recently finished its contract to supply the iron and steel work for a furnace erected by the Toledo Furnace Co., Toledo.

## RECIPROCAL DEMURRAGE

### Is Provided in Proposed Bill Before Iowa Legislature.

A reciprocal demurrage bill has been introduced in the house of representatives of the Iowa general assembly. The measure is drafted to conform with the recommendation made by Governor Cummins in his biennial message to the legislature. It provides that every railroad upon verbal or written application to its agent for cars to be loaded with other than perishable matter, shall furnish the cars within three days from 7 o'clock a. m. of the day following the application, unless prevented by some unavoidable cause. For failure to comply with this request, the bill stipulates the company must pay $2 a day a car, together with all damages the applicant may sustain. After the delivery of cars is made, the applicant under the measure is allowed 48 hours to load. After the cars are loaded, it is provided the company must carry them forward at a rate of not less than 80 miles a day of 24 hours, and in failure of this requirement, the company is liable to the shipper $2 a car a day. It is further specified that the railroad company shall give notice to the consignee of arrival of cars 24 hours after their arrival. A breach of this provision makes the road liable to pay $2 a car a day.

On the other hand, shippers are to have 48 hours for loading cars of a capacity of less than 80,000 pounds, computing from 7 o'clock a. m. of the day after the car is placed, and the shipper must pay to the company $2 a day for every day's delay, unless such is unavoidable. The measure further stipulates that the railroad company shall not be compelled to deliver cars for shipment to persons in default of payment of fine. This provision is intended to afford the railroad companies ample protection against indiscriminate demand for cars and neglect upon the part of shippers to load when such cars are delivered. When goods are shipped in less than carload lots, the company may charge for more than 48 hours' storage one cent per 100 pounds. The bill makes it permissible for two or more shippers to begin joint action against a company in suits for collection.

### Builds Steel Postal Car.

A steel postal car has just been turned out by the Pennsylvania Railroad Co. at its Altoona shops. The car is 70 feet in length and is practically entirely of metal, the total amount of wood being less than 1-3 of one per cent of the weight. In width it is of the Pennsylvania standard cross section, but the length is ten fet greater than that of the company's ordinary postal cars. It is both a letter and paper distributing car and contains the necessary storage room. The car has six-wheel trucks, and is electrically lighted from an axle driven generator. The car is an experimental one and has not yet been formally approved by the postal department.

### Using Steel Coaches.

The New York Central has gone into the steel coach experiment very extensively. Five cars of this construction have just been delivered in New York and will be placed in the suburban service. The cars will seat 64 persons, are lighted by either electricity or gas and are heated by either steam or electricity.

### Railroad Notes.

Frank Trumbull, president of the Colorado Southern and the Fort Worth & Denver, says the lines he controls have just invested $1,300,00 in new equipment, consisting of 22 locomotives, 1,050 freight and 18 passenger cars, all of which are to be delivered by June 1.

The Norfolk & Western railroad is pushing to completion its shops at Roanoke, Va., which include a foundry 140 x 742 feet. One thousand tons of steel will be used in the frame. A planing mill 99 x 252 feet is being erected. The company has recently installed a magnetic lifting derrick for handling heavy iron, car wheels, etc.

The recently organized $100,000,000 perpetual car trust of the Pennsylvania railroad has recorded at Philadelphia a series of leases covering 21,878 cars. This involves the first issue under the new trust of $25,000,000 certificates in a series of $1,000,000 each. It is said these certificates represent the cost of the cars ordered for delivery during 1906.

The Lackawanna railroad has announced the plans for its new machine and locomotive shops which it contemplates erecting at Scranton, Pa., at a cost of over $2,000,000. The buildings include machine and erecting shop 342 x 580 feet, foundry 120 x 400 feet, storehouse 60 x 275 feet, pattern shop 60 x 120 feet, paint shop 90 x 162 feet, mining departments building, three stories, 80 x 250 feet, power plant 60 x 90 feet, chemical laboratory 42 x 72 feet and other smaller buildings. It is planned to erect the plant this year.

The Florence & Cripple Creek Railroad is erecting new machine shops at Canyon City, Colo. The main structure will be of fire proof construction, 60 x 110 feet.

## NEW ENGLAND EMPLOYERS

### Hold an Important Meeting.—One of the Results of Trade Unionism.

(Special Correspondence.)

Worcester, Mass., Feb. 18.—On the evening of Feb. 14, an epoch making dinner was given, in Worcester, by the members of the Worcester branch of the National Metal Trades Association, to delegates of the association from Fitchburg, Southbridge, Fiskdale, Warren, Athol and other towns in Massachusetts, the following firms being represented: Hobbs Mfg. Co., Whitcomb-Blaisdell Machine Co., Boynton & Plummer, Coes Wrench Co., J. A. Calvin Foundry Co., F. E. Reed Co., Norton Grinding Co., Norton Co., Baldwin Chain Mfg. Co., Wyman & Gordon Co., Sherman Envelope Co., Worcester Pressed Steel Co., Mathews Mfg. Co., Winslow Skate Co., Woodward & Powell Planer Co., Stockbridge Machine Co., Morgan Construction Co., Harrington & Richardson Arms Co., R. E. Kidder, Stewart Boiler Works, Wells Chemical Bronze Mfg. Co., Coates Clipper Co., Prentice Bros. Co., the Blánchard Press, Parker Wire Goods Co., Reed Foundry Co., Spencer Wire Goods Co., United States Envelope Co., all of Worcester; Putnam Machine Co., G. M. Parks Co., Fitchburg Steam Engine Co., Simonds Mfg. Co., Fitchburg Machine Works, W. C. Hardy, all of Fitchburg; American Optical Co., H. R. Litchfield, Hyde Mfg. Co., Dupaul-Young Co., Southbridge; Heywood & Wakefield Bros., Gardner; Union Twist Drill Co., Athol; Rodney Hunt Machine Co., L. S. Starrett Co., Orange; Clinton Wire Cloth Co., Clinton; Flather Machine Co., Improved Paper Machinery Co., Nashua; Worcester Steel Foundry Co., Millbury; also J. H. Watson and J. E. Gardier, Brussels, Belgium.

Never before has there been such a numerous, representative gathering of the manufacturing interests of central New England, contrasting strongly against the spirit prevalent but a few years ago when the interests of each concern were partaken of by itself alone, and its experiments, successes, or processes for fabricating were secreted from the outside world. It is said that "it is an ill wind which blows no one good," and one accomplishment of the unions is certainly this helpful uniting of New England manufacturing industries.

E. M. Powell spoke a few minutes on "The Aims of the Association," and the speaker of the evening was Alonzo W. Whitcomb, of the Whitcomb-Blaisdell Machine Co., who gave a dis-

sertation on "Unionism." He dwelt not on the evils and mischief of unionism, but on its growth, and the causes that led to its progress. Mr. Whitcomb treated his subject deeply and broadly, and showed he has long been a careful student of recent modern civic life.

## PENSIONS EMPLOYES.

The National Machinery Co., Tiffin, O., at a meeting of the board of directors, Jan. 30, created a pension fund for the benefit of employes of the company, who, through old age, have become incapable of further service. The requirement for an employe to avail himself of this benefit is that he has been in the service for not less than 15 years. Any employe is eligible, regardless of whether he is a mechanic, foundryman or yard helper. The rate of pension is $1.00 per day.

## PERSONALS.

Roger B. McMullen has been appointed general sales agent of the Hydraulic Pressed Steel Co., Cleveland.

C. E. Morris, president of C. E. Morris & Co., Columbus, O., manufacturers of structural iron, is spending a vacation in California.

Edward S. Cramp, vice president of the William Cramp & Sons' Ship & Engine Building Co., Philadelphia, has resigned. The retiring vice president was the last of the Cramp family in the firm.

P. Buchert Sr., founder of the Ansonia Copper & Iron Works, Cincinnati, was tendered a dinner recently in honor of his 76th birthday at the dining rooms connected with the plant. Twenty guests attended. Mr. Buchert was the recipient of many congratulations and good wishes.

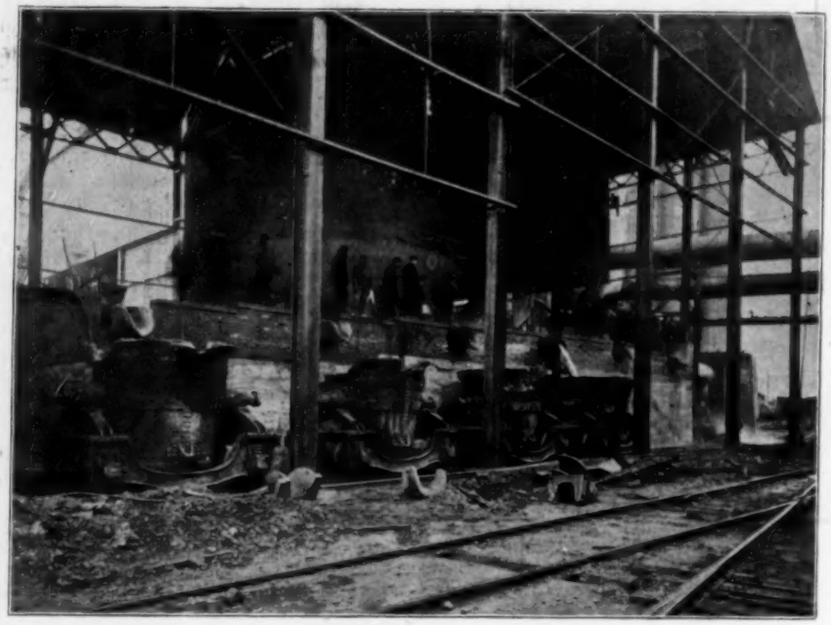
Henry M. Chase has resigned as president of the W. B. Douglas Co., New York, manufacturer of pumps, and E. C. Douglas, who for some time has been treasurer, has been chosen as his successor. Frank W. Bliss has been elected treasurer.

J. P. Shaddick, general manager of the plant of the Southern Steel Co., Gadsden, Ala., has tendered his resignation, to take effect March 1. Mr. Shaddick will attend to business affairs in Florida, where he owns a large orange grove.

P. M. Riley, who resigned his position as superintendent of the foundry of the Illinois Steel Co., Joliet, Ill., to accept the position of general manager of the Armour Steel Co., with plants at Joliet and Matthews, Ind., was the recipient of a farewell banquet from the officers and heads of departments of the former company, Jan. 6. A fine traveling bag was presented to Mr. Riley by his old coworkers.

Gentry Hillman, general superintendent of furnaces with the Southern Steel Co., has resigned, effective March 1. C. E. Buek, vice president with the same company, will retire from the position, though he remains on the directory of the company. It is denied that either E. T. or G. H. Schuler will leave the Southern Steel Co. These gentlemen are in actual control of operations.

Joseph F. Klein, professor of mechanical engineering at Lehigh University, has been presented by the alumni and student body of the school of mechanical engineering with a life membership in the American Society of Mechanical Engineers. This was a testimonial given in recognition of the professor's 25 years of service.



THE FIRST CAST FROM BLAST FURNACE NO. 7 OF THE LACKAWANNA STEEL CO., BUFFALO, 3 P. M., FEB. 14, 1907.

Fred H. Clymer, of Reading, Pa., has been selected as superintendent of the Roane Iron Co.'s plant, Rockwood, Tenn. Willard Warner Jr., the former superintendent, has been chosen president of the Chattanooga Coffin & Casket Co., succeeding his father, who died recently.

Thomas M. Eynon has been appointed by the mayor of Philadelphia to investigate the advisability of the city regaining possession of the gas works from the United Gas Improvement Co., which has been held by the latter under lease for a number of years. Mr. Eynon is vice president and general manager of the Eynon-Evans Mfg. Co., Philadelphia, Pa.

O. A. Stranahan, who recently resigned as sales manager for the Allis-Chalmers Co., Milwaukee, has acquired an interest in the Electric Installation Co., Chicago, and at the annual meeting of that company in January was elected a director. He will take an active part in its affairs. The company is one of the leading engineering and contracting firms in the west in its line, and has a large amount of work, including over 200 miles of electric railway construction. Mr. Stranahan has been engaged in engineering since 1890, spending five years in Europe and returning two years ago.

John S. Ball, Muskegon, Mich., has been made superintendent of foundry for the Jeffrey Mfg. Co., Columbus, O. Mr. Ball has given up his position as general manager of the Enterprise Foundry Co., Muskegon Heights, Mich., but still retains the vice presidency.

John E. Zimmermann, formerly secretary of the American Pulley Co., Philadelphia, has become a partner in the firm of Dodge & Day, engineers, Philadelphia.

H. L. Green, of the Iowa Building Block Machine Co., Waterloo, Ia., has accepted the position as manager of the Concrete Stone Co., of that city. He will still retain his interests in the former company.

**Rolling Wide Plates.**—Milliken Bros., Inc., started rolling, Feb. 11, 20-inch wide plates made in grooved rolls. This is the widest groove-rolled plate ever made for structural purposes, and the product has proven to be entirely satisfactory and equal to universal mill product. Milliken Brothers have made arrangements to roll as wide as 24-inch, but this width has not yet been undertaken by them.

# THE LACKAWANNA STEEL CO.'S NEW FURNACE.

## A HISTORY OF THE ERECTION OF STACK NO. 7.

### Records Broken in Its Construction—Difficult and Interesting Engineering Problems Solved in Building.

By an Editorial Representative of The Iron Trade Review.

With the completion of stack No. 7 within a period of 4 months and 28 days, the Lackawanna Steel Co., Buffalo, has established a phenomenal and unparalleled record in rapid blast furnace construction which is in no danger of being eclipsed. Ground was broken Sept. 15 last year, and the stack was blown in on the afternoon of Tuesday, Feb. 12.

When the first spade was turned, the company's engineering corps had just commenced work on the plans, and upon completion of the excavations the foundation specifications were available. Notwithstanding the speed which marked the operations, whose more important successive steps are graphically shown in Fig. 2, the engineering department was never overtaken and as the work progressed such sections as could be fitted in the boiler and other shops were on the ground when required. As a result of this co-operation, practically no delays were encountered and construction work was carried on without halt.

All the steel plates for the stack, stoves, and steel chimney, and the structural shapes for the skip bridge were fitted in the company's shops, and the cast iron columns for the furnace were likewise made in its foundry, which is one of the many constituents of this complete steel plant. To accelerate the work, many interesting expedients were resorted to which required the highest engineering skill to carry to successful conclusions. The skip bridge, approximately 180 feet long and 75 tons in weight, instead of being built in sections, as is customary, was completed in the structural fitting shop, transported on flat cars to the stack, and one end raised a height of 140 feet to position above the furnace, while the lower end slid on to its foundations. The lower course of stove plates, and the chimney base, were likewise finished in the boiler shop and either elevated or skidded into place. The furnace mantle was raised in two sections, while the down-comer branch to the dust catcher was completed in the shop and likewise elevated in one section.

The shortage of pig metal, owing to the abnormal demands upon the steel departments, and the satisfaction of these requirements at the earliest possible date were the incentives which led to the establishment of this wonderful record. As the erection of the ore and coke bins has been delayed, temporary arrangements have been made for the delivery of this material to a skip car, which will in no way interfere with the continuous operation of the furnace.

#### Previous Records.

The best previous record, which had been considered unassailable, was made in the erection of Furnace K, of the Edgar Thompson group of the Carnegie Steel Co., Pittsburg, which was built in 5 months and 17 days. The Illinois Steel Co., Chicago, recently completed Furnace No. 4, at Joliet, Ill., in 7 months and 8 days, and in view of the difficulties encountered in securing deliveries of equipment, this achievement was considered remarkable. Deferred equipment deliveries likewise proved almost insurmountable problems in the building of the Lackawanna furnace, and on several occasions threatened protracted delays.

The plant, which is designed for two

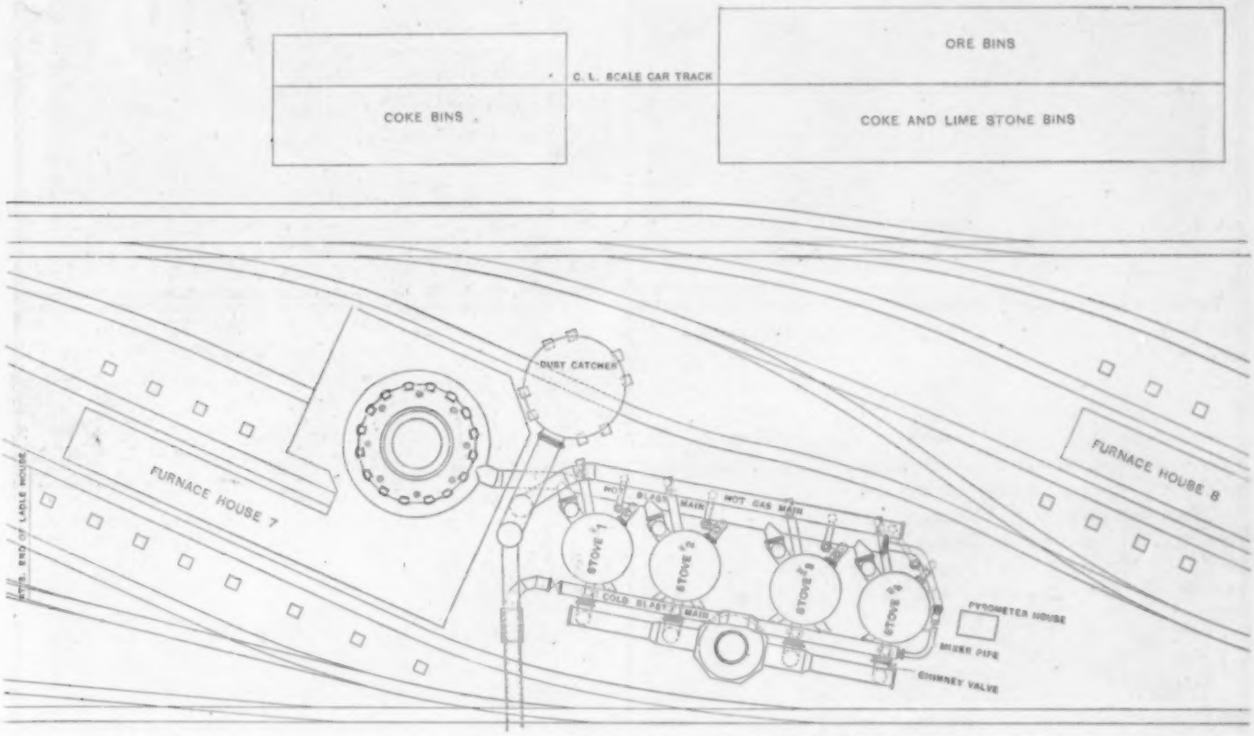



Fig. 1.—Ground Plan of Furnace No. 7, Lackawanna Steel Co.

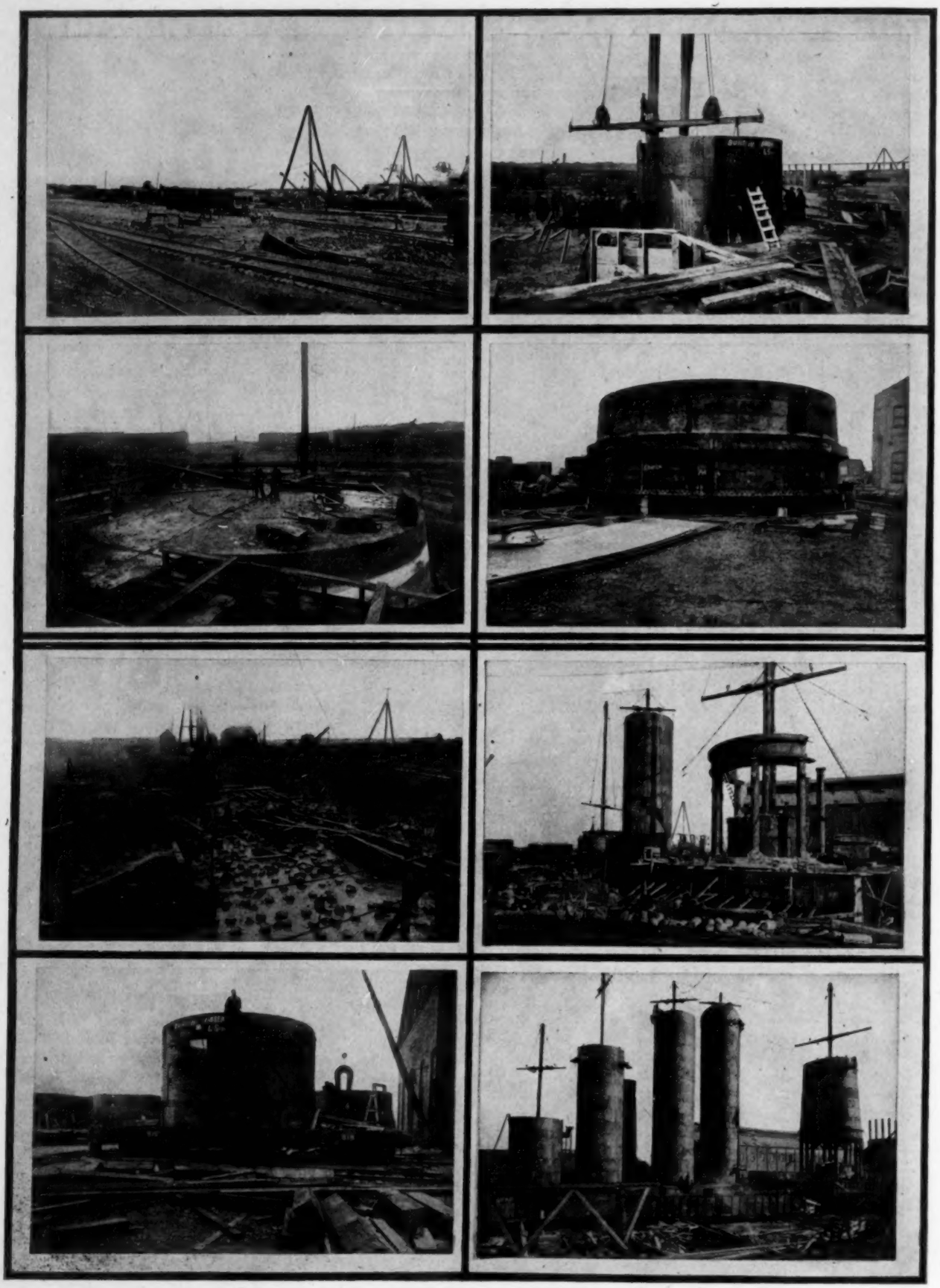


FIG. 2.—BLAST FURNACE NO. 7 IN VARIOUS STAGES OF ERECTION.

From left to right.—Ground broken, Sept. 15, 1906; Hearth jacket placed on furnace pedestal, Oct. 26. (2) Furnace pedestal completed, Oct. 23; Furnace mantel, completed, Oct. 26. (3) Piling for stove foundations, completed Oct. 23; Furnace and stoves, Nov. 6. (4) Hearth jacket on cinder car at bridge shop, Oct. 25; General view of stoves and furnaces, Nov. 16.

furnaces, Nos. 7 and 8, is a continuation of the furnace group which parallels the canal. Its stoves and stack, as shown in the ground plan Fig. 1, are, however, laid out at a slight angle to the slip, to permit of a more advantageous arrangement of yard tracks and the closer spacing of furnaces to be erected in the future. Although not definitely decided, it is probable that furnace No. 8 will shortly be under way.

**Furnace Top.**

The stack, a cross section of which is shown in Fig. 5, has a height of 81 feet 6 inches from the iron tap to the stock line and is 93 feet 6 inches from the tapping hole to the hopper ring. It has a bosh diameter of 22 feet, hearth 15 feet, while the depth of the former is 12 feet and of the latter 10 feet 6 inches. The 16 tuyeres are 7 inches in diameter. The lines of the furnace are similar to those of the remainder in this group, which have a batter of only 39-64 of an inch to the foot. This is the first stack of the group that is provided with a closed top, Figs. 4 and 6, which is of the Kennedy type, has only one bleeder, and is further equipped with the McKee stock distributor. This consists of a steel plate revolving hopper carried on ball bearings. The balls have a diameter of 2½ inches, and there are 130 in the race. A steel gear in cast concentric with the hopper and meshes with a pinion which is driven through bevel and spur gears by means of a 10-horsepower electric motor fastened to the furnace top, as shown in Fig. 6. Its movement is controlled by the same operator who raises and lowers the bells. Upon the discharge of a skip load of ore or coke into the receiving hopper, the motor is set in motion and the hopper is rotated 90 degrees, or one-fourth of a revolution. The charge is then allowed to fall into the lower hopper and another skip load is discharged as before. The hopper is again rotated 90 degrees and the charge is again allowed to fall into the lower hopper. In this way a uniform distribution of stock is secured, as the discharge of four skip loads is required to complete one revolution. The entire top is made in halves bolted together, which greatly simplifies the making of repairs.

The hearth jacket, which is 21 feet 6 inches diameter, is of steel plate construction and is water cooled by means of a concrete trough covered with floor plates in the usual manner. The skip bridge is 180 feet long, of the trussed type of construction and carries two 6-foot tracks over which the skip cars operate. It is pin-connected to the furnace top and is anchored at the bottom with foundation bolts. The movement of the skip cars is accomplished by means of an Otis electric hoisting engine.

The down-comers are 5 feet 9 inches in diameter, and the dust catcher, which contains a center wall to prevent the swirling of the gas and to insure the deposit of a maximum amount of dust, has a diameter of 32 feet. The concrete wall extending around the hearth jacket is reinforced with steel bars in order that it may better resist the force of break-outs and explosions.

Notwithstanding the fact that the stack is of the same size and capacity as the others in this group, being rated at 500 tons daily, the height of the stoves has been materially reduced. All of the stoves for the last four furnaces have a height of 134 feet while the four provided for No. 7 are only 110 feet over all, and 22 feet in diameter. It is believed that they will have practically the same efficiency, with a smaller heating surface, as those of the greater capacity. They are of the center combustion type, Fig. 7, and are provided with five cleaning doors each.

FIG. 3.—VIEW OF FURNACE NO. 7, DEC. 21.

FIG. 4.—FURNACE TOP COMPLETED, JAN. 24.

**Slag and Iron Runners.**

The cast house is of steel construction, 92 feet x 64 feet 3 inches, and has an ell over the iron runners 45 x 64 feet, and the column bases of its floor are 15 feet 8 inches above the ground level. Special attention was given to the arrangement of the runners. The floor of the cast house slopes 1 inch to the foot and the two slag runners empty into a trough having three spouts, which discharge into ladles on the west side of the building. One cinder runner on the west side of the ell discharges into four

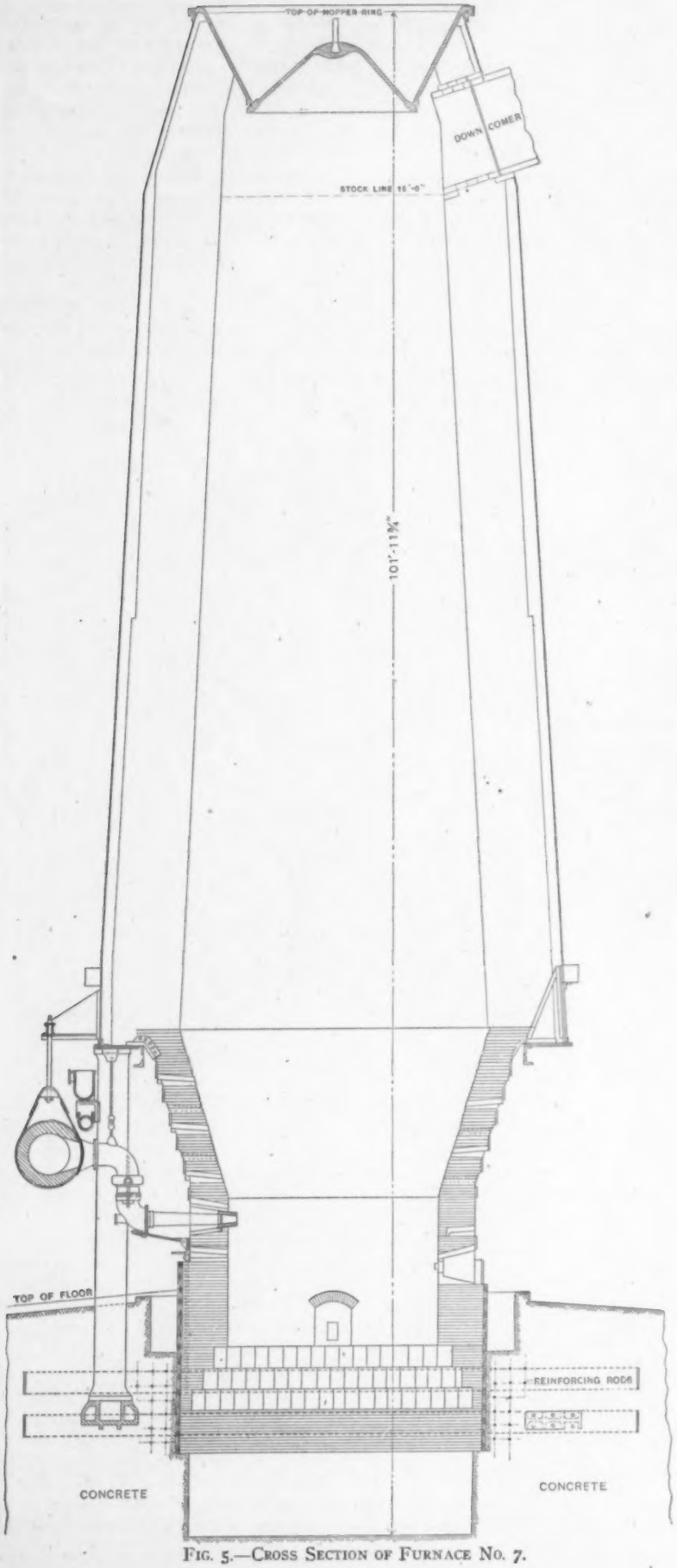



FIG. 5.—CROSS SECTION OF FURNACE NO. 7.

ladles, and is also arranged for connection with the main iron runner by means of a sand runner. The iron runner branches into two troughs, which discharge into eight ladles of 20 tons each on the east side of the ell. The slag is carried in cars to the granulating pit which serves all of the furnaces and is located in another end of the yard. The runners are of cast iron construction, made from furnace metal and are faced with mud, while at the bends they are faced with fire brick to prevent cutting out. The gates are operated by a swivel lever which permits them to be swung out of the way when not in use.

As the ore, coke and limestone bins for this furnace have not yet been built, temporary arrangements have been made for loading the skip cars. The coke will be delivered from the ovens in end-dumped larries of the same type as those used at the other furnaces to temporary bins erected over the skip pit. The pans are held at one end by a pin bearing and the elevation of the other end by a motor driven hoist discharges the load. This device was described in THE IRON TRADE REVIEW, Dec. 31, 1903.

The ore will be delivered to the skip by an electrically driven scale car of the Hoover & Mason type, which will operate on the ground level and will secure its ore supply from the bins now serving the other furnaces. This car was described in THE IRON TRADE REVIEW, Sept. 4, 1902.

### Ore Bins.

The new bin system will be a continuation of that serving the first six furnaces, but will be of the Hoover & Mason type of construction. The ore, coke and limestone bins will be 154 feet long and 46 feet 9 inches wide. They will be built with double hoppers and provisions will be made for longitudinal wooden partitions. With the partitions in position, storage capacity will be provided for coke and limestone, and with them withdrawn, additional capacity will be given for ore, which will overflow into this section, the construction of which is shown in Fig. 8. This gives a flexible storage capacity which is particularly desirable, for coke and limestone which must be carried on cars the length of the bin system of the remaining six furnaces. The 22 coke and stone pockets have a capacity of 1,940 cubic feet each, and the ore pockets 2,140 cubic feet. The discharge of the ore, coke and limestone from the pockets into the scale car is accomplished by means of Hoover & Mason rollers which are rotating cylinders five feet in diameter. The aperture for the exit of the ore is in all cases equal to the width of the pocket, so that the ends of the pocket are vertical. When it is desired to withdraw ore these rollers are set in motion and form a conveyor which carries the ore out of the

pocket and to a considerable extent loosens the mass within the pocket. The rollers are actuated by a motor driven continuous shaft, which can at will be geared to the rollers by friction devices. The rollers on the coke side are perforated, making a most effective screen for the separation of dust from the coke. Extending the length of the sloping sides of the ore and stone pockets are heating chambers for the purpose of preventing the freezing of this material during the winter months. These chambers practically form false bottoms and are constructed of steel plates reinforced on the inside with layers of cement one inch thick to reduce radiation. These chambers are heated with exhaust steam, the use of which incurs no additional expense.

**Coke Bins.**

The main coke bin, Fig. 9, which discharges directly into the skip cars, will be constructed of steel plates and shapes similar to the other bins and will have four sloping sides, being pyramidal in form. It will be 90 feet long, 38 feet 9 inches wide, and will be in line with the other bins. The chute openings are 2 feet 6 inches wide and the gates, which are controlled by a lever, are counterweighted. The coke and limestone will be delivered to the bins from cars operating on an elevated track, and the ore from transfer cars, which are of the side dump type, the opening of the doors being effected by gravity, while they are closed by a small motor. The operator's cab is placed upon an out-rigger in the rear of the car, so that he may avoid danger from scattering lumps of ore. The size of this car permits ore to be delivered to either side of the pocket or into the restricted length along the pockets. The car body is extremely heavy, so that the rough usage due to its receiving increments of a mass of 15 tons is not destructive to it. The cars

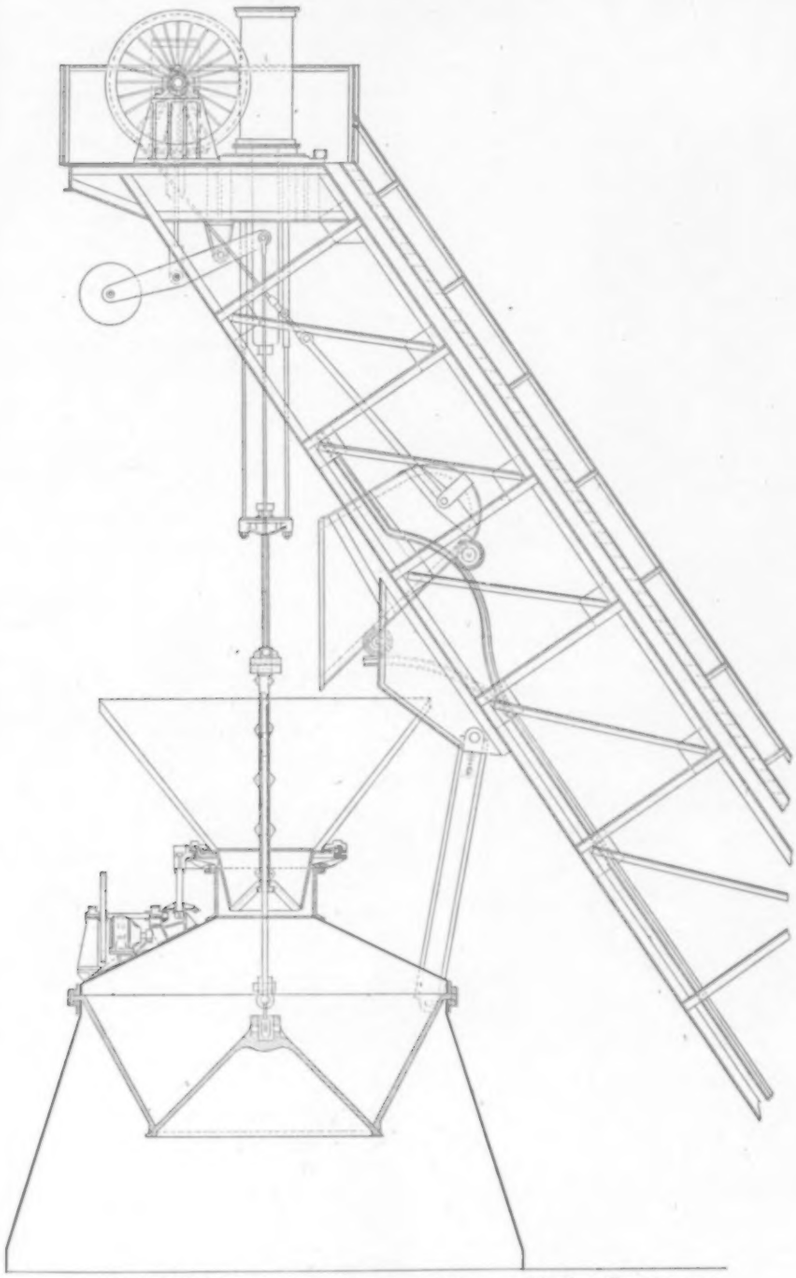


FIG. 6.—FURNACE TOP EQUIPPED WITH A MCKEE DISTRIBUTOR.

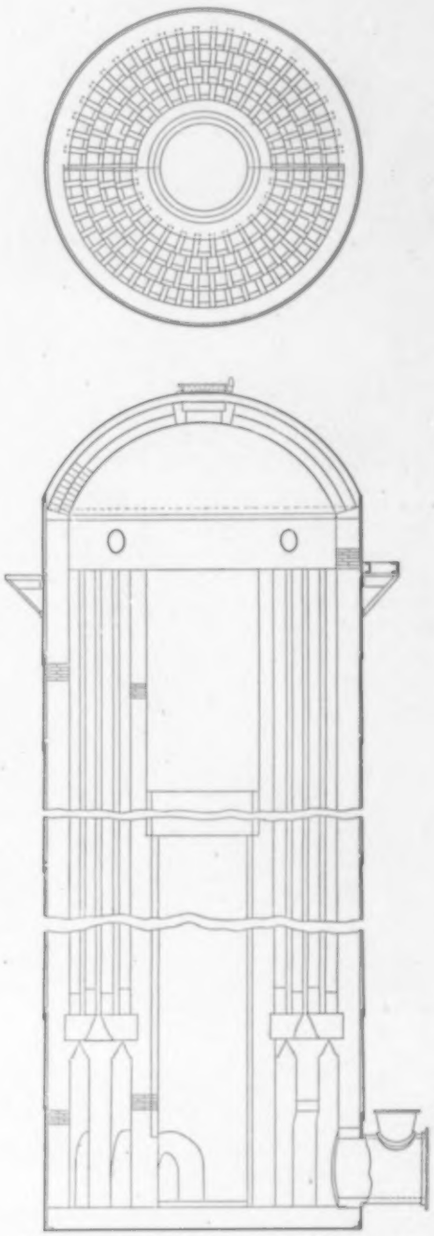


FIG. 7.—CROSS SECTION OF ONE OF THE STOVES.

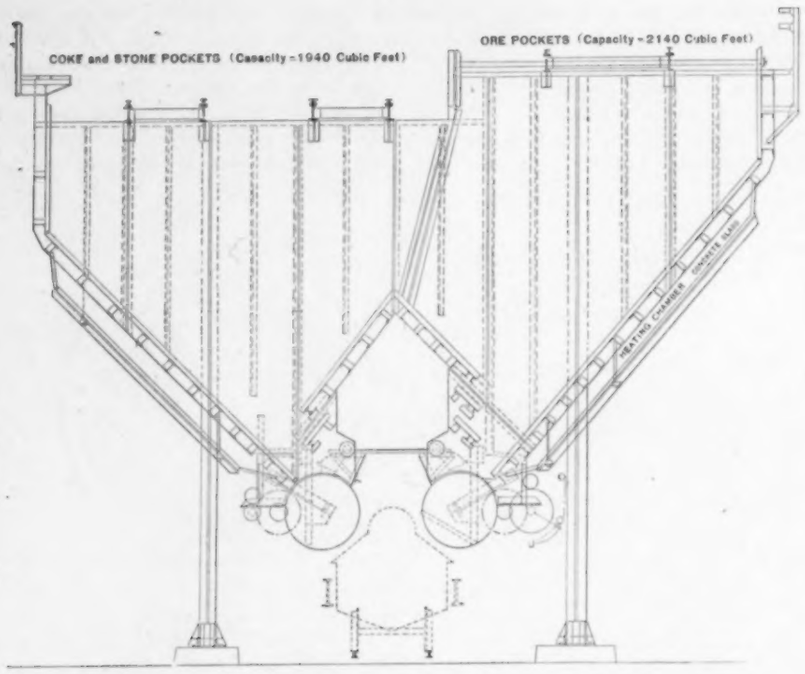



FIG. 8.—CROSS SECTION OF THE ORE, COKE AND LIMESTONE BINS.

are loaded from the bridges which serve the stock piles.

Owing to the peculiar ground formation, piles for all foundations were sunk, to depths varying from 30 to 40 feet, to bed rock, with spacing between centers of three feet for the stoves and stack, and four feet for the cast house. The concrete over the piles has a depth of 12 feet to yard level.

### Novel Erecting Methods.

To accelerate the construction many novel engineering feats were attempted and successfully carried out. The hearth jacket, which is 21 feet 6 inches diameter, and weighs 50 tons, was built complete in the boiler shop and transported to the furnace foundation in one of the company's 75-ton flat cars. It was skidded into place on greased rails laid on heavy timbers. The assembling of the jacket in a period of one week adds further interest to this accomplishment.

The furnace mantle was built in two sections and raised to its position by means of a mast with a swivel boom. The lower course of plates of the stoves was likewise built up in the shop, and skidded on to the foundations. These sections, owing to the use of foundation bolts, were lowered into position with jack screws. Foundation bolts were merely used to hold the stoves in place before the fire-brick checker work had been built up, this extra precaution being taken on account of the high winds which prevail at Buffalo, especially during the winter season. The base of the steel stack, with five courses of plates, was likewise built in the shop and raised on its brick foundations by means of yard cranes. This stack is 175 feet high and 10 feet 6 inches in diameter and the chimney flue is carried through the foundation rather than into the stack proper. This type of construction is uniform throughout the entire plant.

The down-comers were erected in two sections, and elevated to the top of the stack by cranes, while the down-comer branch for the dust catcher was made in one piece.

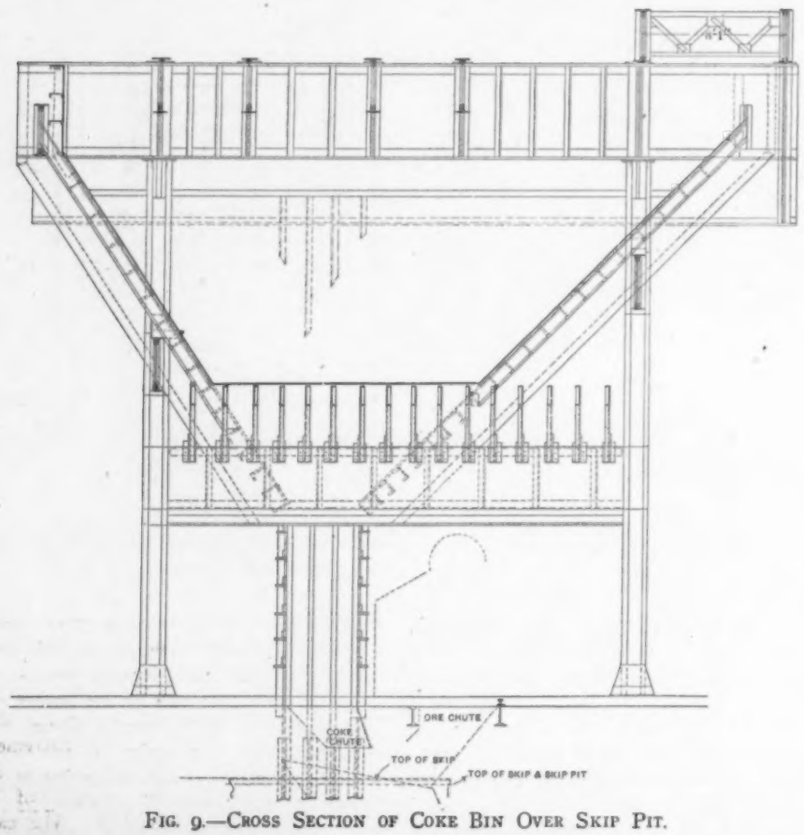



FIG. 9.—CROSS SECTION OF COKE BIN OVER SKIP PIT.

### Skip Bridge.

The erection of the skip bridge, illustrated in Fig. 10, was, however, the most wonderful of the many interesting engineering accomplishments which characterize the erection of this furnace. It was built complete in the structural fitting shop, and transported to the stack with its weight resting on two 75-ton flat cars. It has a length over all of 180 feet and weighs 75 tons. As the length of the bridge as delivered on the cars was parallel to the longitudinal section of the stoves and stack, it was necessary in unloading to swing around the base at right angles to the point, and this was accomplished by means of a yard crane and the use of one of the cars as a pivot, which also held up the upper section of the bridge, while the lower end rested on skids. By the use of two gin poles and ropes, the upper end of the bridge was raised to the top of the furnace and leaned against the stack, until a longer hitch could be taken to raise the bridge the remainder of the way. As the lower end of the bridge is anchored by bolts to the foundation, another difficult problem was presented. Owing to the weight of the bridge, and its position, it was found practically impossible to raise it a sufficient height to clear the bolts. The problem, however, was successfully solved by sinking pockets in the founda-

tion the length of the bolts, which left a flat surface on the foundation for the bridge. As soon as it was set in place, the bolts were lifted, the nuts fastened, and the bolts were later grouted in place.

**Boiler House.**

Simultaneously with the erection of this plant, a boiler house, 67 feet x 94 feet 6 inches, was built. It is of steel construction, has a steel roof and brick curtain walls. It is equipped with 10 Stirling boilers, of 400 horsepower capacity each. The boilers will be gas-fired, the gas being taken from the stack just completed. No additional blowing capacity has been installed, as several of the reserve units will be connected with this plant, nor has the furnace been provided with a gas washer, as the gas will not be used for driving engines.

**Important Dates.**

A chronological record of the erection of the plant in its successive stages of construction is given below:

September 15.—Ground broken.

September 24.—Pile driving commenced.

October 2.—Concrete foundation for cast house begun.

October 10.—Forms for cast house foundation in place, and stack foundation commenced.

October 16.—Form for stack foundation in place.

October 23.—Stack and cast house foundations complete.

October 25.—Hearth jacket left boiler shop.

October 26.—Hearth jacket set on foundation. Furnace mantle completed.

October 31.—Lower course of plates of one stove set on foundation.

November 2.—Furnace columns set.

November 6—Mantle set.

November 16.—Shell of one stove completed.

November 23.—Shells of two stoves completed.

November 30.—Shells of four stoves completed. Platform brackets of stack in place.

December 7.—Steel chimney completed.

December 21.—Dust catcher completed.

December 27.—Incline bridge transported to the furnace.

December 28.—Incline bridge raised.

January 4.—Furnace bosh completed and down-comers attached to furnace top. Foundations for ore bins commenced.

January 18.—Steel frame of cast house completed.

January 24.—Furnace top and distributor completed, bleeder in position.

February 12.—Furnace blown in.

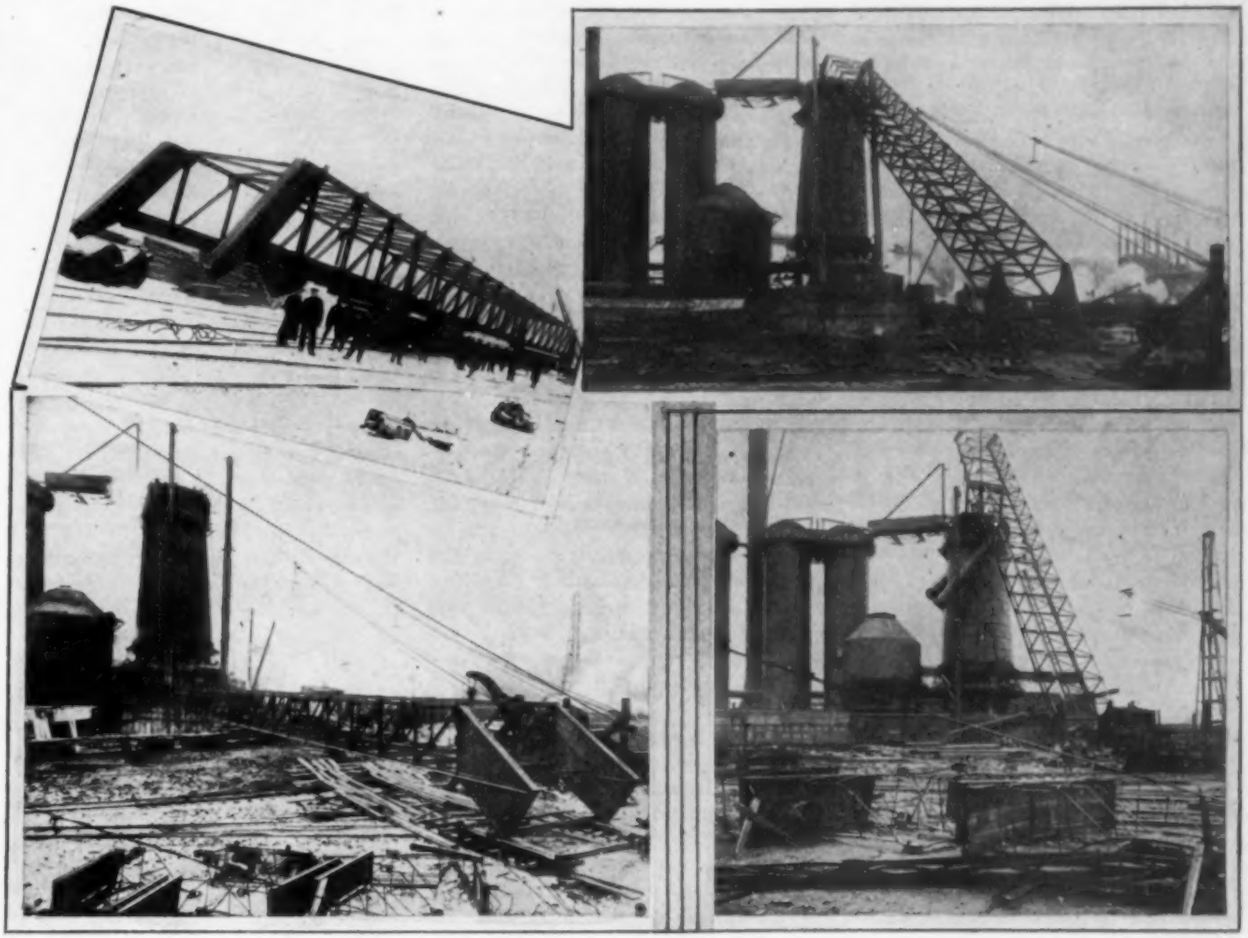


FIG. 10.—INCLINE BRIDGE IN VARIOUS STAGES OF ERECTION.

Transportation of bridge on flat cars.

Bridge in position before being raised.

Bridge raised to top of stack.

Bridge elevated to final position.

---

**A Prosperous Concern.**—The business of the Illinois Corrugated Metal Co., Bloomington, Ill., manufactuirng a corrugated metal culvert, increased 600 per cent over last year. During the year 250 tons of metal were made into culverts which required over 100 cars to transport them from the plant. While the concern is only in its infancy, contracts for the coming year already exceed the remarkable showing made in 1906.

# THE ART OF CUTTING METALS[1]

(Continued from last week.)

By Fred W. Taylor.

## FORGING AND GRINDING TOOLS.

### Theory as to Why no Accurate Relations Exist Between Pressure on Tool and Cutting Speed, Tensile Strength, Etc.

Generally speaking, theories must be accepted with less confidence than facts. The writer, however, ventures to offer the following theory in explanation of the above phenomena as at least corresponding closely to the facts.

It will be recalled that although the tensile strength of soft steels is much lower than that of hard steels, yet in many cases it requires more foot pounds of energy to break by pulling apart in a testing machine a test bar of low tensile strength than one of high tensile strength. The reason for this is that the percentage of stretch or extension in the soft steel bar is in most cases much greater than that in the hard steel. (See tensile strength, stretch, and carbon columns of table 64.) When we consider the fact that throughout the time that a test bar is stretching, all of the grains inside of the bar are continually flowing, moving or sliding past one another under what may be called very heavy internal friction, it becomes clear that in spite of the fact that the pull or power required to cause flow in the grains or crystals of the soft steel is less than the pull required to move the grains of a hard steel bar, yet the greater distance through which the grains of the soft steel continue to flow more than makes up for the difference of tensile strength in the final total of energy expended.

The writer has indicated in the early part of this paper the fact that in tearing a chip from a bar of steel, the grains or molecules of the metal of the chip are caused to flow past one another under very severe compression for a considerable distance, so that the thickness of the layer of metal being removed is double in the chip what it was originally on the forging In the case of a chip torn from soft metal, the movement or flow of the grains of the chip past one another is much greater than in the case of a hard chip. In other words, a soft steel chip is thickened up in cutting much more than a hard steel chip. Thus it becomes clear why in cutting a chip the total energy expended and the pressure of the chip on the tool are in many cases greater with a soft steel than with a hard steel.

Attention is called to the fact that in cutting soft steel, owing to the fact that it thickens more than the hard steel, the chip bears upon the lip surface of the tool over a much larger area than in cutting hard steel, and although undoubtedly the intensity of the pressure on any one small spot on the lip surface of the tool is greater in cutting hard steel, than in cutting soft steel, yet the larger area which is under pressure with the soft steel chip more than makes up in many cases for the difference in the intensity. Therefore, frequently a heavier total pressure is produced with the soft steel than with the hard. It should be noted, however, that in breaking a tensile test bar, the molecules or grains of metal in most cases continue to flow or move past one another until the entire metal of the bar has reached close to its maximum possibility of flow, and until it is at all points ready for rupture, almost all of its potential flowing energy having been exhausted. But in the case of the pressure of the tool upon the chip, the conditions are evidently such that the tool cannot completely use up all of the potential energy in the metal which is being cut, so that doubtless each of the small elements into which the chip breaks up could be crushed and the grains caused to flow past one another still further before entirely reaching the collapsing point. In other words, breaking a tensile test bar is a more efficient means of using up the potential flowing energy of steel than is the crushing action of the tool in removing the chip. If the two methods were equal in using up flowing energy, then we should expect to find the pressure on the tool directly proportional to the tensile or crusing strength of the steel multiplied by its percentage of stretch. This is not, however, accurately the case, and, generally speaking, the harder the steel being cut, the larger the proportion of potential flowing energy that will be used up by the tool in cutting the chip, so that of the two elements or properties of steel which tend to increase the pressure of the chip on the tool, the tensile strength counts for most in producing pressure on the chip.

The pressure of the chip on the tool is doubtless greater, the finer the quality of the metal which is being cut, i. e., in metals which combine both a high tensile strength and a comparatively large percentage of stretch; such, for instance, as the fine quali-

[1] Presidential address, A. S. M. E., 1906.

Table 64.—Pressure on Tool in Cutting Steel Forgings and Castings.

Table shows that no direct proportion exists between the cutting speed and the pressure on the tool; between the cutting speed and the crushing or tensile strength of the steel; between the pressure on the tool and the crushing or tensile strength. The most important data will be found in the five columns with heavy faced type.

| Where experiments were made | Kind of material cut by the tool | Kind of tools used | Aimed at: Depth of cut in inches | Aimed at: Feed in ins. | Actual sectional area of chip in square inches | Cutting speed in feet per minute using standard round nosed tool with 1/4" depth of cut and 1/4" feed | Pressure of chip on tool in tons (2000 lbs.) per sq. inch sectional area of cut | Physical tests of the metals experimented upon: Tensile strength in tons (2000 lbs) per square inch | Physical tests of the metals experimented upon: Percentage of stretch | Chemical composition of metals experimented upon: Total carbon | Chemical composition of metals experimented upon: Silicon | Chemical composition of metals experimented upon: Manganese |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Manchester, Eng. in 1903 | Soft steel forging | Miscellaneous modern English high speed | 1/4 | 1/4 | | 111 | 129 | 30 | 29 | 0.20 | 0.032 | 0.605 |
| | Medium steel forging | Chromium-tungsten or molybdenum tools | 1/4 | 1/4 | | 80 | 121 | 32 | 26 | 0.28 | 0.086 | 0.850 |
| | Hard steel forging | Heated to melting point | 1/4 | 1/4 | | 41 | 168 | 52 | 14 | 0.51 | 0.151 | 0.702 |
| Wm. Sellers & Co. Philadelphia, Pa. in 1902 | Medium steel, (annealed) forging | High speed chromium-tungsten tool heated to melting point | 1/4 | 1/4 | | 84 | 138 | 35 | 30 | 0.34 | 0.163 | 0.600 |
| Wm. Sellers & Co. Philadelphia, Pa. in 1883 | Hard steel roll | Carbon tempered tools were used in these experiments, but the cutting speeds given are those corresponding to modern high speed Chromium-Tungsten Steels heated to melting point and using a depth of cut of 1/4" and feed 1/4" of quality of tool No. 30 Folder 26, Table 128, of standard 1" size. | 1 straight edge tool | 0.05 | 0.05 | 35 | 128 | 51 | 8 | 0.55 | | |
| | Steel forging | | 2 1/4 straight edge tool | 0.02 | 0.0513 | 45 | 132 | 43 | 14 | 0.75 | | |
| | Hard steel car wheel casting | | | | | 22 | 82 | 48* | 3* | 0.82 | | |

*Estimated

ties of low phosphorous steels which have been most carefully worked in forging, or the thoroughly oil tempered and annealed gun forgings, or high grades of tool steel, in all of which exceedingly high combinations of tensile strength and stretch are attained. And again it should be noted that although the pressures on the tool are high in these fine qualities of steel, yet the cutting speeds are by no means proportionally slow. The slowest speeds are to be found in cutting chilled iron or more or less hardened steels, which generally have an exceedingly low percentage of stretch and also comparatively low pressures on the tool.

An illustration of this will be seen by referring to table 64, which furnishes the comparison given below of three pieces of metal. In the first line will be found a forging consisting of a good quality of hard steel experimented upon in the Manchester experments, and in the second and third lines a steel roll and a car wheel casting, necessarily inferior in quality to a forging, experimented upon by Wm. Sellers & Co., of Philadelphia. Both of the steels tested by Sellers are evidently inferior to Manchester steel.

The details of these three experiments are as follows:

| Kind of metal. | Carbon per cent. | Tensile Strength in tons (2,000 lbs.) | Percentage of stretch. | Pressure of chip on tool in tons (2,000 lbs.) | Cutting speed in feed per minute. |
|---|---|---|---|---|---|
| **Steel Forging** | 0.50 | 52 | 14 | 168 | 41 |
| **Steel roll** | 0.55 | 51 | 8 | 128 | 35 |
| **Steel car wheel casting** | 0.82 | 48 | 3 | 92 | 22 |

It will be noted that the percentage of carbon of this forging and roll are about the same, and that the tensile strengths of all three are also about the same. On the other hand, the stretch of the roll is only a little more than one-half that of the forging, showing an inferior quality of metal. The casting has a still lower stretch and is of still lower quality, because it has the quality of the metal indicated by low stretch is also accompanied by a falling off in the pressure of the chip upon the tool; the casting having only 92 tons, the roll having only 128 tons pressure, while the forging has 168 tons. Thus we see that an inferior quality of metal is accompanied by a lower pressure upon the tool. If the metal in the casting had been forged, its tensile strength would probably have not greatly increased, but it would without doubt have had a very materially higher percentage of stretch, and the pressure on the tool would have increased accordingly.

It will be noted that the car wheel casting, which gives a pressure on the tool of only 92 tons per square inch sectional area of the shaving, has a slower cutting speed than any of the other samples of steel which were cut, and yet it has the lowest total pressure on the tool of any steel. This is an excellent illustration of the fact that the hardness in steel which causes a low cutting speed is not accompanied by the highest pressures on the tool. On the other hand, this steel casting has only three per cent of stretch and it is undoubtedly this low percentage of stretch which accounts for the slow cutting speed. We shall attempt to fully explain this point later in the paper.

It is undoubtedly true that the heat which is caused by the pressure of the chip upon the surface of the tool is, broadly speaking, directly proportioned:

*a* To the pressure of the chip upon the tool.

*b* To the cutting speed (i. e., the velocity with which the chip slides across the lip surface).

*c* To the co-efficient of friction between the chip and the tool, which is dependent upon the roughness of the lip surface and undoubtedly grows greater as the surface becomes softer.

In Fig. 3[2], on an enlarged scale are shown the noses of two tools, one cutting a chip of hard steel and the other one of soft steel. The layer of metal being removed from the forging is in both cases of the same thickness. However, it will be noted that the soft steel chip where it presses upon the tool has become very much thicker than the hard steel chip, and also that it bears upon almost twice the area of the lip surface of the tool as does the hard chip. In each view the arrow indicates the center of pressure of the chip upon the lip surface of the tool; and it should be observed that the softer the steel, i. e., the greater its per cent of stretch, the further is the center of pressure of the chip removed from the cutting edge. Now, as explained hereafter, the heat produced by the friction of the chip must be carried away principally down through the nose to the body of the tool. In each view the line A—B represents the section of the tool opposite the center of pressure of the chip which is available for starting the heat on its way downward. It will be noted that the section A—B in the case of the hard chip is much smaller than it is in the case of the soft chip, while at the same time it is much closer to the cutting edge of the tool. Thus, even assuming that the total heat produced by the soft

[2]Iron Trade Review, Jan. 10, 1907.

TABLE 65.—PRESSURE ON TOOL IN CUTTING CAST IRON.

Table shows that no direct proportion exists between the cutting speed and the pressure on the tool; between the cutting speed and the crushing or tensile strength of the cast iron; between the pressure on the tool and the tensile strength. For shape of tool used in William Sellers & Co. experiments see Figs. 20 and 21. The most important data will be found in the four columns with heavy faced type.

| WHERE EXPERIMENTS WERE MADE | KIND OF MATERIAL CUT BY THE TOOL | KIND OF TOOL USED | AIMED AT: DEPTH OF CUT IN INCHES | AIMED AT: FEED IN INCHES | ACTUAL SECTIONAL AREA OF CHIP IN SQUARE INCHES | CUTTING SPEED IN FEET PER MINUTE FOR A CUT 1/4" DEEP 1/8" FEED | PRESSURE OF CHIP ON TOOL IN TONS (2000 LBS.) PER SQ. INCH SECTIONAL AREA OF CUT | PHYSICAL TESTS OF THE METALS EXPERIMENTED UPON: TENSILE STRENGTH IN TONS (2000 LBS) PER SQ. IN. | PHYSICAL TESTS OF THE METALS EXPERIMENTED UPON: CRUSHING STRENGTH IN TONS (2000 LBS) PER SQ. IN. | CHEMICAL COMPOSITION OF METALS EXPERIMENTED UPON: TOTAL CARBON | COMBINED CARBON | GRAPHITE | SILICON | MANGANESE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MANCHESTER, ENG. IN 1900 | SOFT CAST IRON | MISCELLANEOUS MODERN ENGLISH HIGH SPEED CHROMIUM-TUNGSTEN OR MOLYBDENUM TOOLS HEATED TO MELTING POINT | 1/4 | 1/8 | 0.0124 | 100 | 53 | 6.35 | 30 | 3.060 | 0.450 | 2.600 | 3.000 | 1.180 |
| | MEDIUM CAST IRON | | 1/4 | 1/8 | 0.0115 | 49 | 94 | 12.50 | 49 | 3.300 | 0.500 | 2.730 | 1.700 | 0.600 |
| | HARD CAST IRON | | 1/4 | 1/8 | 0.01179 | 32 | 92 | 8.02 | 47 | 3.020 | 1.160 | 1.870 | 1.700 | 0.340 |
| WM. SELLERS & CO. PHILADELPHIA, PA. IN 1902 | SOFT CAST IRON BELOW THE OUTSIDE SCALE ROLL 13" DIA. CAST SOLID | HIGH SPEED | 1/4 | 1/8 | | 148 | 52 | | | | | | 1.95 | |
| | SAME BAR OF CAST-IRON. CUTTING THE SCALE | CHROMIUM-TUNGSTEN HEATED TO MELTING POINT | 1/4 | 1/8 | | 70 | 52 | | | | | | 1.70 | |
| | HARD CAST IRON 13" DIA. CONTAINING 15% STEEL SCRAP CAST 2" THICK HOLLOW CENTER | COMPOSITION OF THESE TOOLS TOOL NO. 20 FOLDER 20, TABLE 126 OF STANDARD 1/4" SHEN | 1/4 | 1/8 | | 45 | 80 | 12.00 | | | | | 1.10 | |

steel chip is greater than that produced by the hard steel chip, nevertheless, on the one hand, there is much more metal available in the case of the soft steel chip for carrying the heat away; and on the other hand, the center of heat, A—B, is further away from the cutting edge, which is that portion of the tool which finally gives out. In addition to this, owing in the case of cutting the hard metal to the small bearing of the chip on the lip surface, the pressure is doubtless much more intense (i. e., greater per square inch of the lip surface under pressure), and therefore in this case the lip surface of the tool must remain much harder in order to resist wear.

It will be observed then that all of these conditions combine to necessitate a slower cutting speed for hard metals than for soft, even if the total pressures of the chip on the tool were to be exactly the same for hard and soft metals. To summarize:

*a* In cutting hard metals the intensity of the pressure per square inch of the lip surface of the tool which comes in contact with the shaving is much greater than in cutting soft metals.

*b* The center of pressure is much closer to the cutting edge.

*c* The section of metal directly below the center of pressure is smaller for carrying the heat away.

All of these conditions which tend greatly toward lowering the cutting speed are brought about not so much through the greater crushing strength of hard steels as through the smaller percentage of stretch in hard steels (i. e., a smaller capacity for flow).

Relating to the classification of various metals according to their hardness, it will be pointed out later that extending over quite a considerable range in hardness, a well-defined law appears to exist, and a formula has been developed in which the cutting speed of steels is shown to bear a clearly defined relation to certain combinations of tensile strength and percentage of stretch.

### Cutting Speed and Pressure of Chip on the Tool Compared for Cast Iron.

Referring now to table 65, on the "Pressure of the Chip on the Tool in Cutting Cast Iron," by examining the columns for cutting speed and the pressure of the chip in tons (2,000 pounds) it will be noted that there is also here no direct relation between the cutting speed and the pressure on the tool. For instance, a pressure of 94 tons per square inch of sectional area of the chip of medium cast iron is accompanied by a cutting speed of 49 feet per minute, while a pressure of only 92 tons is accompanied by a speed of 32 feet per minute; yet, one would naturally expect higher pressures on the tool to be accompanied by slower cutting speeds.

### Cutting Speed and Crushing Strength Compared for Cast Iron.

In comparing the crushing strength with the pressures on the tool, the two seem to be more nearly in inverse proportion one to the other in the case of cutting cast iron than in the case of cutting steel, and yet we have the two combinations of

*a* 49 tons crushing strength with 49 feet cutting speed; and

*b* 47 tons crushing strength with 32 feet cutting speed, showing that there is no constant relation between the two.

### Cast Iron and Steel Compared in the Relation of Cutting Speed to Pressure on Tool.

In comparing cast iron and steel in the relation of pressure of the chip on the tool to the cutting speed, it is surprising to note that generally speaking, the cutting speeds of cast iron are slower than the cutting speeds of steel, while at the same time the pressure of the chip on the tool in cast iron is much less than the pressure on the tool in cutting steel. The theory which we have advanced above, however, appears to account for this difference. It is well known that there is almost no stretch in breaking a cast iron test piece, nor does a compression bar yield to any great extent before the cast iron entirely crumbles. This lack of stretch, as explained, indicates the inability of the grains of cast iron to flow past one another under pressure; and since the metal has no ability to flow, the whole pressure of the chip is concentrated on the lip surface of the tool very close to the cutting edge, so that per unit of area of the lip surface in contact with the cast iron shaving the intensity of pressure is probably as great as in that of the steel chip. It is also probable that cast iron containing more carbon in the form of gritty graphite which is combined in a very hard state, is more abrasive in its action on the tool. All of these conditions tend toward rapid wear of the tool close to the cutting edge, and, therefore, also toward slow cutting speeds.

It is notable that the whole tool is

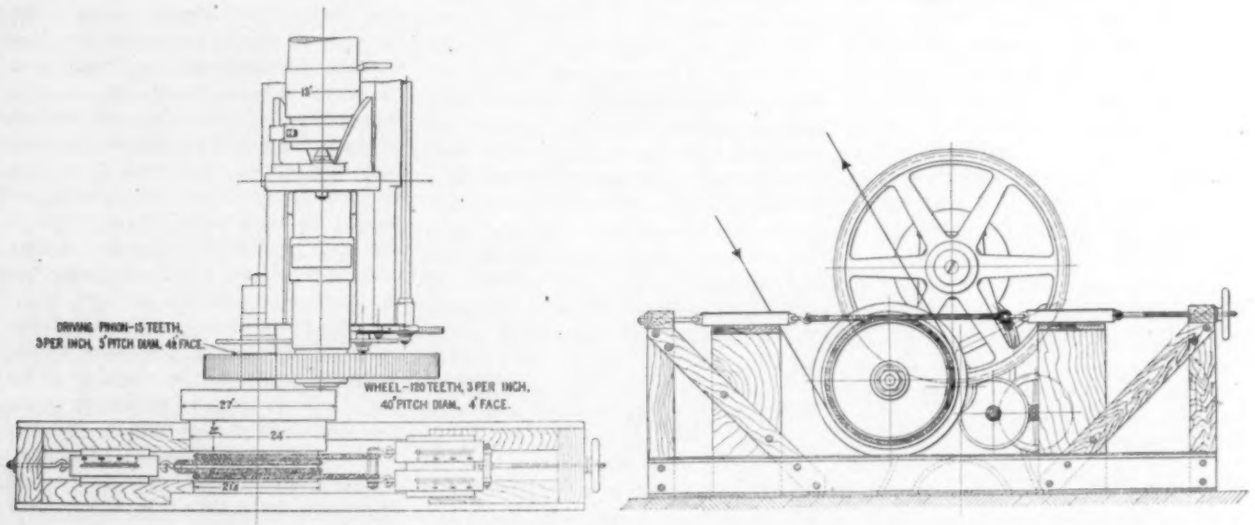



FIG. 66.—DRAWING OF LATHE USED IN DETERMINING THE PRESSURE OF THE CHIP ON THE TOOL.
Shows rope brake with spring balances at each end by means of which the driving force of the lathe was weighed. Experiments made in the shop of William Sellers & Co., Philadelphia, in 1902.

heated to a much lower heat in cutting cast iron than in cutting steel, and yet the tools give out at slower cutting speeds.

### Apparatus Used and Method of Making Experiments on the Pressure of Chip on the Tool in Cutting Cast Iron and Steel.

Two series of experiments for determining the pressure of the chip on the tool in cutting steel and cast iron have been made by us. One set made in 1884, in the Midvale Steel Works, Nicetown, Philadelphia, is of interest only in relation to the power required to feed the tool. The second set was made with greater care and with better appliances in 1902 in the shop of Wm. Sellers & Co., Philadelphia. The latter experiments only will be described in detail.

With the object of warning any future experimenters against the adoption of certain methods in this field, it seems desirable to briefly describe one method which after trial proved to be unreliable and was abandoned by us.

A lathe swinging 16-inch diameter over the shears and 13½-inch diameter over the saddle was driven by a 20-horsepower motor using a current of 220 volts; with a belt running directly from the pulley on the motor to the cone pulleys on the lathe. These cone pulleys drove with the following gearing intervening between them and the face plate of the lathe. Pinion on sleeve of cone pulley: 15 teeth, three per inch, five-inch pitch diameter, 4½-inch face. Wheel on spindle: 120 teeth, three per inch, four-inch pitch diameter, four-inch face.

Many trials were made to determine the pressure of the chip on the tool by first reading the ammeter while the motor was running without the cut, and then noting the difference in its reading after the tool was cutting, and assuming that the difference in the power in the two cases was equal to the work done by the tool.

This method proved unsatisfactory as the fluctuations of the needle of the ammeter were so great under light loads that it was found impracticable to judge with accuracy its average reading. Therefore, as an error in estimating the amperes of current not only directly affects the electrical power expended, but even still more affects the determination of the efficiency of the motor when running under light loads, this method was abandoned as unreliable.

An endeavor was then made to work the motor constantly under a heavier load by attaching an accumulator pump to it in addition to running the experimental lathe. This, however, also proved unsatisfactory.

### Apparatus Used in Experiments on Pressure of Chip on the Tool.

The following simple device was then adopted, with which accurate results were obtained, and which were repeatedly reduplicated, thus proving at least the uniformity of the whole method.

A rope brake was used on one of the steps of the cone pulley of the lathe. This brake, illustrated in Fig. 66, was at that time a somewhat recent improvement on a Prony brake, and consisted merely of a double rope slung around the pulley, having each of its ends attached to spring balances, one of which is stationary and the other of which is attached to the end of a draw screw, which is tightened or loosened by means of a hand wheel whose hub is used as a nut for the screw. The method of experimenting with this apparatus is as follows:

After the tool has been run for a sufficient length of time under cut to bring both the tool and the lathe to what may be called natural conditions as to wear, heat, friction, etc., the reading of the ammeter is noted as accurately as possible while the tool is under pressure. The tool is then removed and the brake is adjusted upon one of the steps of the cone pulley, and tightened until the ammeter reads the same as it did when the tool was under cut. At the same time the readings of the two spring balances are taken; and, since the difference in the readings of the two balances is the effective pull caused by the friction

TABLE 67.—PRESSURE OF THE CHIP ON THE TOOL IN CUTTING CAST IRON.

Tool used, standard round nose roughing tool, clearance angle six degrees, back slope eight degrees, side slope 14 degrees, shown in Figs. 18, 23, 25, and 26, with various feeds and depths of cut. Cutting speed about 60 feet per minute.

| DEPTH OF CUT IN INCHES | SOFT CAST IRON — Tensile Strength 12400 — Chemical Composition: Combined Carbon, Graphite, Manganese, Silicon 1.7 per cent, Phosphorus, Sulphur | | | | | | | | | | | | HARD CAST IRON — Tensile Strength 26000, Silicon 1.9 per cent | | | | PRESSURE IN POUNDS IN CUTTING HARD CAST IRON FIGURED BY FORMULA 43,000 $D^{1.6}$ $f^{1}$ — COMPARE THESE FIGURES WITH THE EXPERIMENTAL FIGURES IN THE FOUR COLUMNS OF THIS TABLE | | PRESSURE IN POUNDS IN CUTTING HARD CAST IRON FIGURED BY FORMULA 68,000 $D^{1.6}$ $f^{1}$ — COMPARE TO SAME FIGURES WITH THE EXPERIMENTAL FIGURES IN THE FIFTH COLUMN OF THIS TABLE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ¼" TOOL. SEE FOLIOS 13, FIG. 60 | | | | ⅜" TOOL. SEE FOLIOS 13, FIG. 58 | | | | ½" TOOL. SEE FOLIOS 13, FIG. 55 | | | | 1" TOOL. SEE FOLIOS 13, FIG. 60 | | | | ¼" TOOL. SEE FOLIOS 13, FIG. 61 | | | | FEED OF ¼" TOOL | | | |
| | REVOLUTIONS PER MINUTE | FEED IN INCHES | PRESSURE IN POUNDS: ON TOOL | PRESSURE IN POUNDS: PER SQ. IN. | REVOLUTIONS PER MINUTE | FEED IN INCHES | PRESSURE IN POUNDS: ON TOOL | PRESSURE IN POUNDS: PER SQ. IN. | REVOLUTIONS PER MINUTE | FEED IN INCHES | PRESSURE IN POUNDS: ON TOOL | PRESSURE IN POUNDS: PER SQ. IN. | REVOLUTIONS PER MINUTE | FEED IN INCHES | PRESSURE IN POUNDS: ON TOOL | PRESSURE IN POUNDS: PER SQ. IN. | REVOLUTIONS PER MINUTE | FEED IN INCHES | PRESSURE IN POUNDS: ON TOOL | PRESSURE IN POUNDS: PER SQ. IN. | FACE-TOOTH | CHISEL-EDGE | PRESSURE IN POUNDS: ON TOOL | PRESSURE IN POUNDS: PER SQ. IN. | PRESSURE IN POUNDS: ON TOOL | PRESSURE IN POUNDS: PER SQ. IN. |
| 1/16 | 980 | 0.0020 | 400 | 160000 | 493 | 0.0164 | 473 | 222000 | 494 | 0.0330 | 317 | 157000 | 984 | 0.0330 | 317 | 157000 | | | | | | | | | | |
| | 981 | 0.0030 | 604 | 312000 | 494 | 0.0330 | 552 | 154000 | 494 | 0.0330 | 626 | 312000 | 984 | 0.0660 | 570 | 284000 | | | | | | | | | | |
| | 982 | 0.0040 | 758 | 378000 | 495 | 0.0660 | 721 | 361000 | 495 | 0.0660 | 773 | 384000 | 985 | 0.0990 | 773 | 384000 | | | | | | | | | | |
| | 983 | 0.0050 | 870 | 437000 | 496 | 0.0990 | 903 | 451000 | 496 | 0.0990 | 904 | 452000 | 987 | 0.1320 | 904 | 452000 | 1160 | 0.0040 | 1450 | 178000 | | | | | | |
| | 984 | 0.0010 | 1157 | 105000 | 497 | 0.1320 | 1115 | 556000 | 497 | 0.1320 | 1019 | 508000 | 988 | 0.1650 | 1019 | 508000 | 1161 | 0.0080 | 1450 | 197000 | | | | | | |
| | 985 | 0.1200 | 1200 | 78000 | 498 | 0.1650 | 1400 | 698000 | 498 | 0.1650 | 1316 | 656000 | 989 | 0.1980 | 1316 | 656000 | 1162 | 0.1200 | 1355 | 195000 | | | | | | |
| | | | | | | | | | | | | | 990 | 0.2640 | 1740 | 770000 | 1164 | 0.1600 | 1356 | 140000 | | | | | | |
| 3/16 | 986 | 0.0012 | 570 | 145000 | 499 | 0.0248 | 661 | 194000 | 501 | 0.0502 | 593 | 182000 | 991 | 0.0502 | 593 | 182000 | | | | | | | | | | |
| | 987 | 0.0024 | 914 | 180000 | 500 | 0.0990 | 891 | 196000 | 502 | 0.0990 | 891 | 197000 | 992 | 0.0990 | 891 | 197000 | | | | | | | | | | |
| | 988 | 0.0040 | 1014 | 114000 | 501 | 0.0660 | 933 | 196000 | 503 | 0.0660 | 1009 | 154000 | 993 | 0.1320 | 1009 | 154000 | 1167 | 0.0400 | 1020 | 141000 | | | | | | |
| | 989 | 0.0012 | 993 | 88000 | 502 | 0.0858 | 1138 | 102000 | 504 | 0.0990 | 1265 | 113000 | 994 | 0.1980 | 1265 | 113000 | 1168 | 0.0600 | 1775 | 145000 | | | | | | |
| | 990 | 0.0800 | 1338 | 68000 | 503 | 0.0990 | 1338 | 68000 | 505 | 0.1320 | 1643 | 83000 | 995 | 0.2640 | 1643 | 83000 | 1170 | 0.0800 | 1500 | 132000 | | | | | | |
| | 991 | 0.1200 | 1442 | 67000 | 504 | 0.1254 | 2100 | 99000 | 506 | 0.1650 | 1914 | 97000 | 996 | 0.3300 | 1914 | 97000 | 1169 | 0.1000 | 1900 | 117000 | | | | | | |
| | | | | | | | | | | | | | 997 | 0.3960 | 2019 | 73000 | 1161 | 0.1253 | 2000 | 77000 | | | | | | |
| 5/16 | 942 | 0.0313 | 700 | 180000 | 513 | 0.0171 | 604 | 130000 | 499 | 0.0198 | 661 | 130000 | 666 | 0.0332 | 593 | 129000 | | | | | | | | | | |
| | 943 | 0.0020 | 1008 | 112000 | 511 | 0.0784 | 733 | 86000 | 670 | 0.0990 | 1080 | 130000 | 999 | 0.0990 | 1130 | 129000 | 1163 | 0.0804 | 1543 | 188000 | | | | | | |
| | 944 | 0.0040 | 1428 | 158000 | 510 | 0.0440 | 1163 | 91000 | 671 | 0.1320 | 1407 | 113000 | 1000 | 0.1980 | 1407 | 113000 | 1164 | 0.0400 | 1020 | 142000 | | | | | | |
| | 945 | 0.0012 | 1570 | 85000 | 509 | 0.0825 | 1317 | 74000 | 672 | 0.1650 | 1705 | 93000 | 1001 | 0.2640 | 1705 | 93000 | 1165 | 0.0600 | 1675 | 144000 | | | | | | |
| | 946 | 0.0060 | 1533 | 74000 | 508 | 0.0990 | 1940 | 70000 | 673 | 0.1980 | 2071 | 96000 | 1002 | 0.3300 | 2010 | 94000 | 1166 | 0.0800 | 2440 | 134000 | | | | | | |
| | 947 | 0.1200 | 2028 | 72000 | 507 | 0.1200 | 2660 | 73000 | 674 | 0.1970 | 2670 | 86000 | 1003 | 0.3960 | 2970 | 82000 | 1167 | 0.1000 | 2970 | 137000 | | | | | | |
| | | | | | | | | | | | | | 1004 | 0.4620 | 3010 | 71000 | 1168 | 0.1880 | 3010 | 110000 | | | | | | |
| 7/16 | 948 | 0.0220 | 1086 | 117000 | 501 | 0.0165 | 686 | 146000 | 663 | 0.0171 | 1174 | 102000 | 973 | 0.0313 | 1083 | 114000 | 1169 | 0.0204 | 980 | 134000 | | | | | | |
| | 949 | 0.0024 | 2013 | 149000 | 502 | 0.0264 | 1200 | 113000 | 664 | 0.0264 | 1343 | 97000 | 974 | 0.0660 | 1737 | 129000 | 1169 | 0.0510 | 2370 | 168000 | | | | | | |
| | 950 | 0.0460 | 1907 | 107000 | 503 | 0.0660 | 1770 | 93000 | 665 | 0.0440 | 1687 | 98000 | 975 | 0.0990 | 2000 | 107000 | 1170 | 0.0460 | 2002 | 140000 | | | | | | |
| | 951 | 0.0800 | 2301 | 99000 | 504 | 0.0858 | 2043 | 86000 | 666 | 0.0660 | 2250 | 94000 | 976 | 0.1320 | 2000 | 93000 | 1171 | 0.0800 | 3760 | 163000 | | | | | | |
| | 952 | 0.0900 | 2040 | 77000 | 505 | 0.0990 | 2200 | 82000 | 667 | 0.0909 | 2189 | 83000 | 977 | 0.1913 | 2173 | 87000 | 1172 | 0.0913 | 4200 | 158000 | | | | | | |
| | 953 | 0.1267 | 4240 | 73000 | 506 | 0.1200 | 2880 | 79000 | 668 | 0.1201 | 2882 | 78000 | 978 | 0.1980 | 4150 | 75000 | 1173 | 0.1200 | 4830 | 130000 | | | | | | |
| 1/2 | | | | | 508 | 0.0248 | 1086 | 127000 | 667 | 0.0170 | 1966 | 139000 | 981 | 0.0313 | 1964 | 145000 | 1174 | 0.0300 | 2480 | 213000 | | | | | | |
| | | | | | 509 | 0.0330 | 1500 | 115000 | 668 | 0.0264 | 2280 | 107000 | 982 | 0.0660 | 3045 | 111000 | 1175 | 0.0510 | 3400 | 177000 | | | | | | |
| | | | | | 510 | 0.0440 | 1980 | 105000 | 669 | 0.0440 | 2940 | 96000 | 983 | 0.0990 | 4154 | 105000 | 1176 | 0.0600 | 4200 | 187000 | | | | | | |
| | | | | | 511 | 0.0660 | 2940 | 104000 | 670 | 0.0660 | 4020 | 97000 | 984 | 0.1320 | 4960 | 94000 | 1177 | 0.0800 | 5880 | 183000 | | | | | | |
| | | | | | 512 | 0.0990 | 4040 | 100000 | 671 | 0.0909 | 4921 | 75000 | 985 | 0.1980 | 6764 | 88000 | 1178 | 0.0900 | 6960 | 180000 | | | | | | |
| | | | | | 513 | 0.1252 | 5240 | 91000 | 672 | 0.1222 | 5995 | 75000 | | | | | | | | | | | | | | |
| 243/256 | | | | | | | | | | | | | 986 | 0.0313 | 5450 | 125000 | | | | | | | | | | |
| | | | | | | | | | | | | | 987 | 0.0600 | 6950 | 137000 | | | | | | | | | | |
| | | | | | | | | | | | | | 988 | 0.0833 | 6140 | 98000 | | | | | | | | | | |
| | | | | | | | | | | | | | 989 | 0.0910 | 6970 | 93000 | | | | | | | | | | |

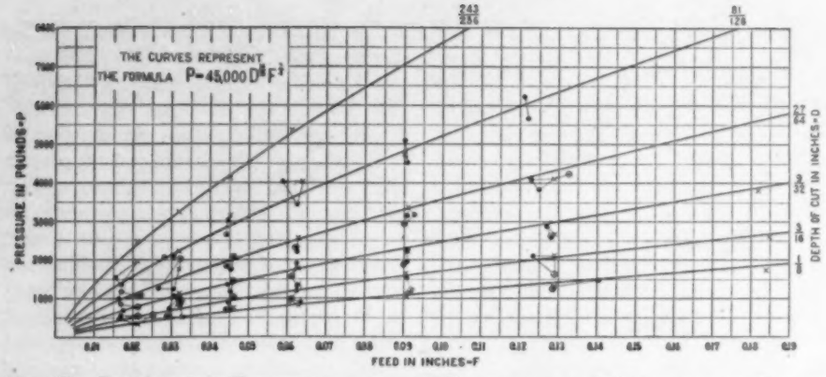



FIG. 68.—SUMMARY OF EXPERIMENTS ON THE PRESSURE OF THE CHIP ON THE TOOL IN CUTTING SOFT CAST IRON.

Tools used, standard ½-inch, ¾-inch and 1¼-inch round nose roughing tools; clearance angle six degrees, back slope eight degrees, side slope 14 degrees, shown in Figs. 18, 23 and 25 with various feeds and depths of cut. For the exact pressures recorded in these experiments and their equivalents in pounds per square inch of sectional area of the chip see table 67. Cutting speed about 60 feet per minute. Silicon 1.7 per cent, tensile strength 12,400 pounds.

of the brake reduced to the central diameter of the brake rope, by multiplying this pull by the central diameter of the rope and by the ratio of reduction from the cone pulley to the lathe spindle, and then dividing this product by the mean diameter of the forging upon which the cut was taken, the quotient obtained gives the pressure on the tool. In this way all of the power lost through friction throughout the entire apparatus is eliminated with the exception of the small difference in the frictional resistance of the bearings and gears which lie between the brake and the tool. It will be observed that the difference in the friction of these parts is small between the two cases when, on the one hand, the tool is cutting, and, on the other hand, the brake is tightened. This difference (unmeasured when the brake is on) must be proportional to the pressure on the tool and, therefore, will in no way affect the relative pressures of the different cuts.

⊙ = ½" tool
● = ¾" tool
× = 1¼" tool
Key to Fig. 68.

It should be noted that it is necessary to take the reading of the ammeter and the two spring balances as soon as practicable after the brake is applied, and before the cone pulleys and ropes become so heated as to cause variation in the frictional resistance of the brake. When this is done, the method is both delicate and accurate.

### Details of Experiments Upon the Pressure of the Chip on the Tool in Cutting Cast Iron With Our Standard Tools.

The following are the general conclusions arrived at on this subject:

(A) Total pressure of chip on the tool in cutting cast iron of the different qualities experimented upon by us varies between the low limit of 35 tons (2,000 pounds) per square inch sectional area of chip for soft cast iron, when a coarse feed is used, see table 63, and table 67, and 99 tons (2,000 pounds) per square inch sectional area of chip for hard cast iron, when a fine feed is used.

(B) In cutting the same piece of cast iron, the pressure of chip on the tool per square inch sectional area of chip grows considerably greater as the chip becomes thinner, and slightly greater as the cut becomes more shallow in depth. The following are the high and low limits of pressure per square inch of sectional area of the chip when light and heavy cuts are taken on the same piece of cast iron. (See table 67, column for 1¼-inch tool.)

Depth of cut ⅛ inch × feed 0.0328 inch: Total pressure per square inch sectional area of chip, 128,000 pounds.

Depth of cut $\frac{27}{64}$ inch × feed 0.1292 inch: Total pressure per square inch sectional area of chip, 75,000 pounds.

(C) The same fact mathematically expressed is that in cutting the same piece of cast iron, the pressure of chip on the tool per square inch sectional area of chip grows greater as the thickness of the chip grows less in portion to (thickness of the feed)$^{\frac{1}{4}}$.

The pressure of chip per square inch of section also grows greater as the depth of the cut grows less in proportion to (depth cut)$^{\frac{1}{15}}$.

(D) The effect upon the pressure of the chip on the tool of a change in the thickness of the feed and the depth of the cut is the same for hard and soft cast iron, and is represented by the same general formula, with a change merely of the constant. (For formula, see six paragraphs below.)

(E) In taking cuts having the same depth and the same feed, the pressure of the chip on the tool becomes slightly greater the larger the cutting tool that is used. This increase in the pressure follows from the fact that the larger the curve of the cutting edge of the tool the thinner the shaving becomes.

The principal object in making the experiments described in detail below was to determine, broadly speaking, the maximum pressures upon the tool per square inch of sectional area of the chip, both in cutting soft and hard cast iron, when our standard shop tools of different sizes were used; this information being needed in designing machine tools, for this purpose the highest pressure of 99 tons (2,000 pounds) as indicated in table 67, should be sufficient.

Our secondary object, and one of almost equal importance, was that of obtaining the pressure on the tool per square inch of sectional area of the chip being cut, corresponding to various changes in the depth of cut and in the thickness of the feed. This information is needed in determining by means of our slide rules, the exact sized cut which each machine tool is capable of taking under its possible combinations of pulling power, speed

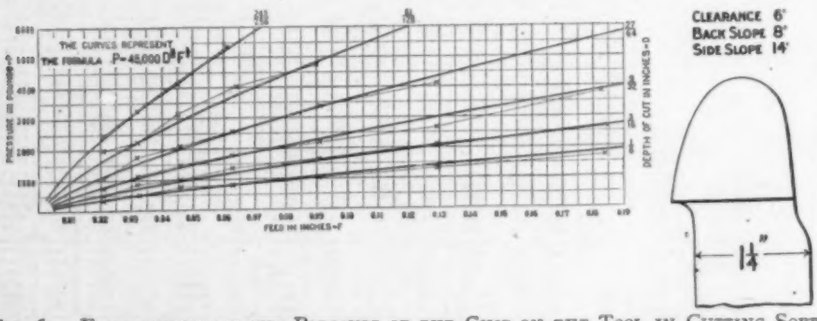



FIG. 69.—EXPERIMENTS ON THE PRESSURE OF THE CHIP ON THE TOOL IN CUTTING SOFT CAST IRON.

Tool used, standard ¾-inch round nose roughing tool, clearance angle six degrees, back slope eight degrees, side slope 14 degrees, shown in Fig. 23, with various feeds and depths of cut. Cutting speed about 60 feet per minute. Experiments made at shop of William Sellers & Co., Philadelphia, in 1902. For exact pressures recorded in these experiments and their equivalents in pounds per square inch of sectional area of the chip see table 67. For chemical composition and physical tests of the cast iron experimented upon see table 67.

and changes in the thickness of feed.

In table 67, will be seen a summary of the actual pressures obtained under various conditions in these experiments, and in adjoining columns the pressures are reduced to pounds per square inch of sectional area of chip. The same data are recorded in the diagrams, Figs. 68 to 72, by means of round spots which are connected in series with one another by faint lines, so that all of the experiments made with the same depth of cut can be readily compared.

On the left-hand side of each of these diagrams are recorded the regularly increasing pressures per square inch of sectional area of the chip upon the tool; while on the bottom line are recorded the regular increases in the thickness of the feed.

In a series of heavy lines on each diagram are drawn curves corresponding to the following formula, which expresses the general relation existing between the depth of cut and the feed, and the pressure on the tool for all of the grades of cast iron experimented upon:

$$P = C D^{\frac{1}{2}} F^{\frac{3}{4}}$$

in which

$P$ = The pressure on the tool;

$D$ = Depth of cut in inches;

$F$ = Feed in inches;

C = A constant depending upon the softness or hardness of the cast iron, and which varies between the limits of 45,000 for soft and 69,000 for hard cast iron, as experimented on by us.

In Fig. 68 are combined all of the various experiments given in detail in the other diagrams. In these diagrams the heavy lines represent the same formula above referred to, while the round spots which are grouped together in series indicate all of the pressures obtained with the various sized tools used and with the different feeds and depths of cut taken in the several sets of experiments.

It will be noted that, on the whole, the law expressed by this formula corresponds very closely to each of the several series of experiments. These experiments were made on different dates, and the pressures were accurately recorded without reference in any case to the data obtained in former experiments. And the fact that they all, on the whole, so closely conform to the same general law, tends greatly towards confirming both the value of the apparatus and of the method employed, and also the accuracy and care of the experimenters.

It will be remembered, as stated above, that the conclusion drawn from the Manchester experiments was that the pressure of the chip upon the tool per square inch of sectional area of chip was directly proportional to the area of the chip and was the same whether light or heavy cuts were taken, and that it did not depend upon either the thickness of the feed or the depth of the cut. This conclusion is at variance with our experiments and with the above formula, which mathematically expresses our results. It may be claimed that the slight difference in the friction of the machine caused our records to indicate slightly heavier pressures than those actually received by the tool, and that the difference between the results of our experiments and the Manchester experiments can be explained in this way. Unquestionably this slight error in the frictional resistance tends towards recording pressures somewhat higher than the actual pressures; but since the errors are proportional to the pressures, it is evident that it in no way accounts for the relative difference between thick and thin shavings in results obtained by the two sets of experiments. The following data further confirm this reasoning, and also the correctness of our conclusion that the pressure increases as the chip grows thinner.

In the comparison given below we have taken the data from two experiments made with the same tool upon the same piece of cast iron. (See table 67.)

| Depth of cut. | Thickness of feed. | Total section of chip. | Pressure in lb. on tool per sq. in. of sectional area of chip. |
|---|---|---|---|
| 1/8" | 0.0916 | 0.01145 | 102,000 |
| 7/64" | 0.0220 | 0.00928 | 117,000 |

It will be noted that in both of these experiments chips having approximately the same sectional area were cut, but in one case a thin feed and a deep cut were used; while in the other case a thick feed and a shallow cut were used; and that in spite of the total areas being approximately the same, the thin feed was accompanied by a materially higher pressure per square inch than the thick feed. In all such instances, it is clear that the frictional error, if any, caused by our apparatus is entirely eliminated as far as it affects thin or thick chips. Many more similar illustrations of this fact can be taken from the data recorded in the tables.

Further evidence confirming the fact that the pressure varies with the thickness of the shaving will be seen by referring to the first paragraph of the next section, and it should be noted also that in this matter the German experiments are in agreement with ours. As stated above, the Manchester experiments do not extend to feeds as fine as those taken in ours, and for this reason it is possible that the results obtained by them were in this particular misleading.

(To be Continued.)

## AUTOGENOUS WELDING OF STEEL.

Worcester, Mass., Feb. 9.—The Worcester Pressed Steel Co. has just installed a plant for doing autogenous welding of steel by the Epurite process. It is the second plant of the kind in the United States, the other one being at the works of the Fore River Ship Building Co., Quincy, Mass. The weld is made with a blow pipe, the gases used being oxygen and acetylene. The flame is very small, with a temperature of 6,300 degrees Fahr. The company has several ordinary employes now using this method, it not being necessary to have an expert. The flame is extremely bright and the workman is obliged to wear goggles with colored lenses to protect his eyes. Each workman has his own blow pipe, with a pressure gage and reducing valve, the pressure depending on the thickness of the weld. The company has erected a small building a short distance from the main shop, which is equipped with apparatus for generating oxygen and acetylene, a partition separating the two generators.

The oxygen is generated from epurite, a powder which contains oxygen in a form susceptible of easy liberation on contact with water, the oxygen given off being chemically pure. The welding process is named from this powder. The oxygen generator is charged with water and epurite. A solution of sulphate of iron is allowed to flow into the generator to act as a catalytic agent for the generation of oxygen. The liberated oxygen goes through a pipe underground into a gasometer in the main building and is pumped from thence into a tank under 150 pounds pressure. A pipe leading from this tank runs the entire length of a bench where the outlet pipes for the operators are located.

The acetylene apparatus is arranged to furnish the gas at two and one-half pounds pressure, the pressure of 150 pounds being intended to counteract the possible back burning of the mixture before reaching the burner. No danger exists to the operator from an explosion, and in addition to keeping the gases separate until reaching the

point of combustion, the pipe is provided with wire gauze to prevent back firing. In lighting the blow pipe the acetylene is first turned full on, and regulated to about one-half atmosphere. Then the oxygen is turned on, after the acetylene is lighted. The oxygen flow is controlled so there is only one inner cone in the flame. The flame is then neutral and ready for use. By this process iron, steel, copper, brass, cast iron and other metals can be effectively welded. To bring about the proper conditions for autogenous welding of two metals, it is necessary to bring them to their melting point without oxidizing or carbonating. The hydrogen and carbon dioxide generated in the oxy-acetylene flame form a reducing atmosphere and permit the metal to be autogenously welded. These two gases protect the molten metal and are then burned entirely into carbonic acid and water by the surrounding air. No flux is required in this process of welding.

At the works of the Fore River Ship Building Co., the process is being used to good advantage, the large metal plates being welded instead of riveted. The oxy-acetylene flame is also used advantageously for cutting metals, instead of sawing, and prevents waste.

**New England Industries.**

The Massachusetts Machine Shop, Inc., recently organized, capital stock $25,000, will shortly begin operations in Worcester, Mass. The officers are Henry W. Knights, president; Charles A. Whiteknact, vice president and general manager; Arthur A. Knights, treasurer. The company will make a specialty of all kinds of grinding, particularly automobile crankshafts.

The Norton Grinding Co Worcester, Mass., is putting in foundations for an addition to its plant, which will double the capacity. The company recently completed a commodious office building.

The Heald Machine Co., of Worcester, Mass., has just completed a new boiler house. This company, which is the successor of L. S. Heald & Son. of Barre, Mass., builds a line of grinding machines. Among the recent additions to its product is a machine for grinding the interior of cylinders for automobile and motor boat engines. Worcester is decidedly a grinding center. It has the Norton Co., the largest factory in the world, making grinding wheels, and grinding machines are made by the Norton Grinding Co., Heald Machine Co., Washburn Shops, and O. S. Walker & Co.

The annual meeting of the National Mfg. Co., Worcester, Mass. resulted in the re-election of the old officers, F. W. Collier, president; Jas. F. Upham, clerk; Chas. A. Norman, treasurer. The company makes wire goods. It has just completed a 5-story brick store house.

J. E. Snyder & Son, Worcester, makers of upright drills, are planning to build a shop for the manufacture of their drills. They now occupy rented quarters.

The new branch of the Morgan Spring Co., Worcester, located at Struthers, near Youngstown, Ohio, is partially running, and when in full operation, it expects to employ about 1,000 men. At Struthers the company will make its own steel. The company manufactures practically all goods made by the American Steel & Wire Co. Many of its Worcester experts have gone to Struthers to start the work at the new plant.

## COMPARATIVE PRICES OF PIG IRON AND IRON ORE.

On the opposite page is presented a chart showing the prices at which iron ore has sold during the 18 years, 1890-1907, together with the prevailing prices of Bessemer and No. 2 foundry iron at the date at which the ore-buying movement was at its height.

The idea is to establish in graphic form the relation of the raw material price to that of pig iron and to show the influence exerted by the latter in fixing the price of ore. When consideration is given to the fact that two tons of ore go to make up every ton of iron, thus rendering doubly sharp the changes in ore prices, and that quotations on coke usually fluctuate in considerable harmony with those of ore, a remarkable similarity between the two series of lines is manifested. This must be taken as an indication that ore prices have been entirely in keeping with the iron price at the time they were established.

In compiling this chart quotations and other information have been taken from files of THE IRON TRADE REVIEW. The valley prices of iron and the Lake Erie dock prices of ore have been used throughout. Practically no Bessemer ore was shipped from the Mesabi range until 1893, while the first Mesabi non-Bessemer was not marketed extensively until two years later, hence the blanks in the early nineties.

In an incidental way the chart is interesting in a number of particulars, especially in regards to the time of the buying movement. The season of 1907 was the earliest on record, the most active point of the market being about Nov. 10, 1906. Next to that 1906, with Dec. 5, and 1890 and 1899, each with Dec. 15 of the previous year, were unusually early.

In the accompanying table THE IRON TRADE REVIEW presents the date of the ore-buying season, with prices prevailing on Old Range Bessemer, Mesabi Bessemer, Old Range non-Bessemer and Mesabi non-Bessemer ores, and the valley prices of Bessemer and No. 2 foundry iron at the dates indicated. It should be noted that the basic guarantee of iron content was changed last November. On both Old Range and Mesabi Bessemer the natural iron content was reduced from 56.70 to 55.00 per cent, and on both Old Range and Mesabi non-Bessemer the reduction was from 52.80 to 51.50 per cent. On this new basing schedule, prices for the 1907 season are as follows:

| | |
|---|---|
| Old Range Bessemer | $5.00 |
| Mesabi Bessemer | 4.75 |
| Old Range non-Bessemer | 4.20 |
| Mesabi non-Bessemer | 4.00 |

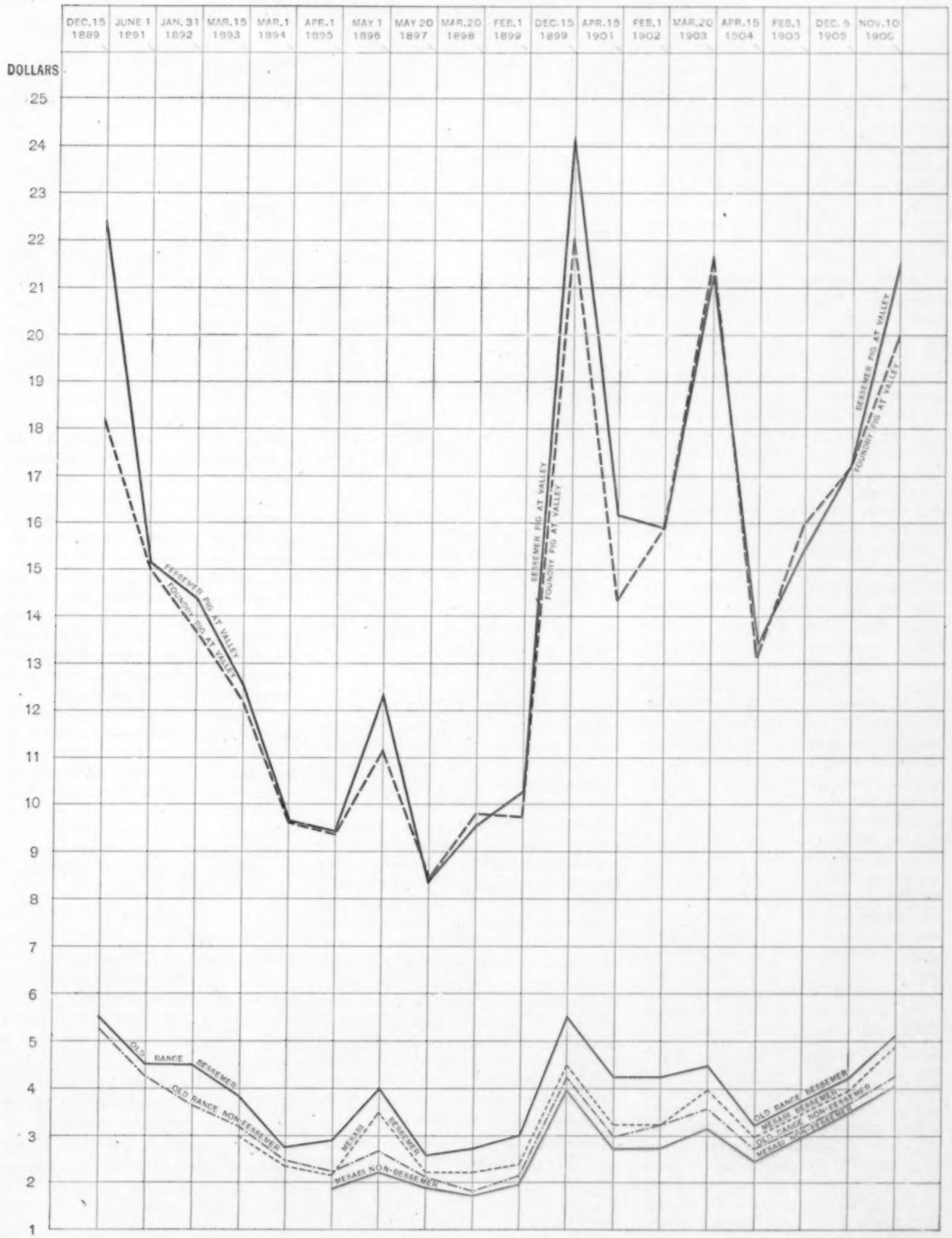
For comparison in the table with the prices obtaining in recent years, however, the 1907 rates are figured on the iron content heretofore maintained, and not the reduced base.

**PRICES OF IRON ORE AND PIG IRON.**

| Season. | Date Buy. Movement. | Season Iron Ore Prices. O. R. Bess. | Mes. Bess. | O. R. non-B. | Mes. non-B. | Iron Prices, Valley. Bess. | No. 2 Fdy. |
|---|---|---|---|---|---|---|---|
| 1890 | Dec. 15, '89..... | $5.50 | no sale | $5.25 | no sale | $22.15 | $18.15 |
| 1891 | June 1, '91..... | 4.50 | no sale | 4.25 | no sale | 15.15 | 15.00 |
| 1892 | Jan. 31, '92..... | 4.50 | no sale | 3.65 | no sale | 16.40 | 13.65 |
| 1893 | March 15, '93.... | 3.85 | $3.00 | 3.20 | no sale | 12.65 | 12.15 |
| 1894 | March 1, '94..... | 2.75 | 2.35 | 2.50 | no sale | 9.65 | 9.65 |
| 1895 | April 1, '95..... | 2.90 | 2.15 | 2.25 | $1.90 | 9.40 | 9.40 |
| 1896 | May 1, '96..... | 4.00 | 3.50 | 2.70 | 2.25 | 12.40 | 11.15 |
| 1897 | May 20, '97..... | 2.60 | 2.25 | 2.15 | 1.90 | 8.35 | 8.40 |
| 1898 | March 20, '98.... | 2.75 | 2.25 | 1.85 | 1.75 | 9.55 | 9.80 |
| 1899 | Feb. 1, '99..... | 3.00 | 2.40 | 2.15 | 2.00 | 10.30 | 9.75 |
| 1900 | Dec. 15, '99..... | 5.50 | 4.50 | 4.25 | 4.00 | 24.15 | 22.15 |
| 1901 | April 15, '01..... | 4.25 | 3.25 | 3.00 | 2.75 | 16.15 | 14.40 |
| 1902 | Feb. 1, '02..... | 4.25 | 3.25 | 3.25 | 2.75 | 15.90 | 15.90 |
| 1903 | March 20, '03..... | 4.50 | 4.00 | 3.60 | 3.20 | 21.50 | 21.65 |
| 1904 | April 15, '04..... | 3.25 | 3.00 | 2.75 | 2.50 | 13.35 | 13.15 |
| 1905 | Feb. 1, '05..... | 3.75 | 3.50 | 3.20 | 3.00 | 15.50 | 16.00 |
| 1906 | Dec. 5, '05..... | 4.25 | 4.00 | 3.70 | 3.50 | 17.25 | 17.25 |
| 1907 | Nov. 10, '06..... | 5.15 | 4.90 | 4.30 | 4.10 | 21.50 | 21.50 |

**Valuable Statistical Charts.**—R. G. Beker, Frick building, Pittsburg, has just completed a new chart showing graphically the production of grain in the United States. A number of other valuable and similarly designed diagrams in connection with steel, coal and coke and pig iron production in this country have come from the same source in the past.

## COMPARATIVE PRICES OF IRON ORE AND PIG IRON.



## LABOR SHORTAGE

**Presents Serious Problem in Canadian Railway Extensions.—Other Industrial Notes.**

(Special Correspondence.)

Toronto, Can., Feb. 15.—A serious difficulty in the way of the extensive work contemplated in railroad construction during the coming season is the shortage of labor in the west. The announcement is made by immigration officials in Winnipeg, based on returns from railroad contractors, that 59,000 men will be required, and a heavy immigration appears to be the only source of supply. Mackenzie & Mann, of the Canadian Northern railway, can employ 10,000. They will build a branch line north from Edmonton to Athabasca Landing, 100 miles in length, and a line running 200 miles west from Edmonton to the Rocky Mountains. Foley, Larson & Co. want 8,000 men for the construction of the line from Fort William to a junction with the Grand Trunk Pacific, 210 miles, and the main line of the G. T. P. from Saskatoon to Edmonton, 327 miles. J. D. McArthur has on hand the completion of the Wolseley-Reston branch line and the section of the Grand Trunk Pacific from Winnipeg eastward, 245 miles, and can give work to 7,000 men. The Macdonald-MacMillan Co. wants 3,000 men for the contracts on the Grand Trunk Pacific from Portage La Prairie to the Touchwood Hills and other work. The Canadian White Co. has the section from the Touchwood Hills to Saskatoon, 140 miles requiring 1,500 men. The Canadian Pacific Railway construction department can give work to 10,000 men at various western points, including an extension from Edmonton and double-tracking the section between Winnipeg and Fort William. An equal number will be needed for track maintenance, surfacing, ballasting and other work in connection with the western railroad extensions. Contractors during the coming season will be more than ever dependent upon a large volume of immigration, and in case it is not forthcoming, considerable delay in these important enterprises is likely to result.

The Billing & Spencer Co., Hartford, Conn., will undertake the manufacture of drop forgings at Welland, Ont. A contract has been let for the erection of a $100,000 plant to occupy ten acres. It will employ about 100 men at first.

The Dominion Power & Transmission Co., with a capital of $25,000,000 and head office at Toronto, has been incorporated. It is understood to be controlled by the Mackenzie & Mann interests and is given very extended powers, which in addition to the ordinary branches of the electrical industry, include smelting by electricity and the carrying on of any manufacturing or other business.

The Wingold Stove Co., Ltd., has been incorporated by Frederick B. Blanchard, Otto Gensmer, Robert Kellow and others with $40,000 capital and head office at Winnipeg, to manufacture stoves, furnaces, etc.

The plans of the Ontario Iron & Steel Co., the new works of which have been under construction for some time at Welland Ont., have been altered so as to extend the undertaking very considerably, and an expenditure of $300.000 is now arranged for. The works, which will employ about 500 men, are expected to be completed by June 1. The Canadian Nut & Bolt Co. will erect a factory at Niagara Falls, Ont., having secured large contracts in advance. A large car construction plant is to be started at Montreal by Fred. Eaton, president of the American Car & Foundry Co., Berwick, Pa. and other capitalists. Owing to the demand for locomotives, the Canada Foundry Co., Toronto, which recently secured large contracts from the Canadian Northern Railway and other lines is largely extending its machine shops, so as to double the present capacity. The Canadian General Electric Co. is erecting an additional large machine shop at Peterborough, Ont.

The Manitoba Rolling Mills Co., Ltd., has been organized at Winnipeg with $100,000 capital, to take over and operate the Kirkwood Iron & Steel Rolling mills of that city. The mills were built by T. M. Kirkwood, of Toronto, who becomes vice president of the new company, a large interest in which is taken by Lewis A. McElroy, of the United States Horseshoe Co., Erie, Pa., and other American capitalists.

Tudhope, Anderson & Co constitute another Winnipeg enterprise just incorporated with $300,000 capital, for the manufacture of agricultural implements, machinery and vehicles. The leading promoter is James B. Tudhope, carriage manufacturer of Orillia, Ont.

Preliminary work has been begun on the works of the Dominion Radiator Co., on Dufferin street, Toronto. The plant will be the largest in Canada, the site comprising 10 acres. The buildings will be 2,500 feet in length, of brick and steel. The force employed by the company will be increased from 200 to 500 men. The estimated cost is $300,000.

The report of the Canadian department of trade and commerce for September last shows a great increase in the imports of iron and steel over the corresponding month of 1905. The total imports for home consumption last September were valued at $5,847,813, as against $3,540,835 in September, 1905.

## FREIGHT RATES

**And Sunday Trains Being Considered by the Alabama Legislators.**

(Special Correspondence.)

Birmingham, Ala., Feb. 16.—Pig iron and steel manufacturers in Alabama are interested in probable legislation in the state, as a number of bills are now pending in the legislature in session at Montgomery which might affect their interests. Representatives of some of the larger iron, steel and coal corporations in the Birmingham district have been to Montgomery and have made addresses before committees of the legislature opposing some of the bills which have been presented in one or the other branches of the legislature. Much interest is being taken in a bill to prohibit the operation of freight trains on Sundays It is set forth that many furnaces and other works in the industrial section of Alabama would be affected if the freight trains were stopped on Sunday, inasmuch as sometimes a large amount of raw material has to be handled on Sundays. Then again it is claimed that because of single track lines, the railroads handling the traffic of the iron, steel and coal corporations use Saturday nights, Sundays and Sunday nights in moving off accumulated freight on the main lines, all such freight as is not urgent being held during the week until the time mentioned, when engines are brought from the industrial branches and used in moving trains on the main line. A law prohibiting freight trains on Sundays would, it is claimed, impair the transportation service for the manufacturers. There are many advocates in Alabama for the law to prohibit the Sunday freights, the church element in particular taking a decided stand therefor.

Taxation of corporations which are not considered home institutions, regulation of railroad freight rates and several other bills pending in the legislature have been given some attention by the larger industrial corporations of Alabama and the outcome is being watched closely. It appears that the present legislature is one that believes in decided regulation of freight rates, giving additional powers to the railroad commission, etc. Gov. Comer and others in charge of the government in Alabama have stated that they do not intend to be hard on corporations or any legitimate interests, but that the interests of the people will be looked after.

# Huge All-Rail Shipment of Lake Superior Ore in 1906 Shown by Official Figures.

The statement showing the shipments from each mine of the Lake Superior region, together with the totals from the various ranges, which THE IRON TRADE REVIEW compiles annually, is here presented for the year ending Dec. 31, 1906. The supplement, showing the shipment record of the mines since the beginning of mining in the Lake Superior district, will be issued next week. The output in gross tons, as indicated, was 38,522,139, of which 1,008,544 tons was hauled by rail, an unprecedented all rail shipment, and 37,513,595 tons by lake. Comparing these figures with those of some previous years, as shown in the table accompanying, an increase for 1906 over 1905 of 4,168,683 tons is indicated, the unexpectedly large all rail shipment developing a considerably greater shipment than was anticipated. These figures do not include the shipment from the Helen mine in Ontario belonging to the Lake Superior Corporation, which amounted to 121,555 tons.

It will be readily noted that of the tonnage gains made in 1906 over 1905, almost the entire amount came from the Mesabi range, the Marquette and Gogebic ranges, on the contrary, falling behind their production of the previous year. Not only is the output of the Mesabi range wonderful, but even more remarkable is the rapidity with which it has grown, as shown by comparing its output in the last three years. In 1904 the Mesabi mines yielded 12,156,008 tons; in 1905, 20,153,699 tons; and in 1906, 23,792,782 tons. While this fact, as compared with the development of the other ranges, is not otherwise than those who know the characteristics of the range would expect, it is none the less impressive and none the less indicative of a remarkable display of energy on the part of mining companies interested, in taking advantage of the natural ease of mining. Of the total shipment in 1906, the Mesabi ores comprised 61.8 per cent, as compared with 58.66 per cent in 1905; 55.7 per cent in 1904, and 53 per cent in 1903. Of the ore shipped from the Mesabi, approximately 50 per cent was of Bessemer grade. The shipping list was increased by the opening of 13 new mines, namely, the Adriatic, Brunt, Crosby, Hobart, Hull-Rust, Jennings, Larkin, Mayas, Mohawk, St. Paul, Susquehanna, Victoria and Wacoutah. This was responsible for 2,298,661 tons of the shipment increase. The most noteworthy of these new mines is, of course, the Hull-Rust open pit adjoining the Mahoning mine at Hibbing. Attention may be called to the Virginia mine, sometimes called the Oliver or Mesabi Mountain, which now includes the Ohio, Norman and Lone Jack. These properties are being stripped and will form one open pit in the future, all shipments being grouped under the name Virginia. The Tesora mine also, which was opened up this year by Capt. M. L. Fay, and later leased to the New York State Steel Co., experienced the change of name to Larkin. The Aetna mine is now included in Mountain Iron, and the old Cloquet mine is now part of the Spruce. In the accompanying table only those mines which produced in 1906 are listed, though in the supplement all mines producing since 1896 will appear, as usual.

On the Gogebic range there was but one new mine on the shipping list, the Castile, which did not produce sufficient, however, to counterbalance the inability to approach the output of 1905 from the range. Some explanation may be of assistance in regard to the Aurora and Pabst mines, which are now included in the Norrie group. The shipment from the Hennepin mine includes 667 tons taken from the old Pence shaft. The Eureka mine is almost a new shipper, for it has resumed this year for the first time since 1896. The Davis mine of the Steel Corporation, formerly listed as the Wisconsin, is to be known as the Davis in the future. It appears from developments during the past year on the Goge-

SHIPMENTS BY RANGES, GROSS TONS.

| | 1906 | 1905 | 1904 | 1903 | 1902 | 1901 |
|---|---|---|---|---|---|---|
| Marquette Range | 4,057,187 | 4,210,522 | 2,843,703 | 3,040,245 | 3,868,025 | 3,245,346 |
| Menominee Range | 5,109,088 | 4,495,451 | 3,074,848 | 3,749,567 | 4,612,509 | 3,619,083 |
| Gogebic Range | 3,641,985 | 3,705,207 | 2,398,287 | 2,912,912 | 3,663,484 | 2,938,155 |
| Vermillion Range | 1,792,355 | 1,677,186 | 1,282,513 | 1,676,699 | 2,084,263 | 1,786,063 |
| Mesabi Range | 23,792,782 | 20,153,699 | 12,156,008 | 12,892,542 | 12,342,840 | 9,004,890 |
| Miscellaneous | 128,742 | 111,391 | 67,480 | 17,913 | ..... | ..... |
| Total | 38,522,139 | 34,353,456 | 21,822,839 | 24,289,878 | 27,571,121 | 20,593,537 |

SHIPMENTS BY PORTS AND ALL-RAIL, GROSS TONS.

| | 1906 | 1905 | 1904 | 1903 | 1902 | 1901 |
|---|---|---|---|---|---|---|
| Escanaba | 5,851,050 | 5,307,938 | 3,644,267 | 4,277,561 | 5,413,704 | 4,022,668 |
| Marquette | 2,791,033 | 2,977,828 | 1,907,301 | 2,007,346 | 2,595,010 | 2,354,284 |
| Ashland | 3,388,106 | 3,485,344 | 2,288,400 | 2,823,119 | 3,553,919 | 2,886,252 |
| Ashland | 3,388,106 | 3,485,344 | 2,288,400 | 2,823,119 | 3,553,919 | 2,886,252 |
| Two Harbors | 8,180,125 | 7,779,850 | 4,566,542 | 5,120,656 | 5,605,185 | 5,018,197 |
| Gladstone | ..... | 5,118,385 | 4,169,990 | 3,978,579 | 4,180,568 | 2,321,077 |
| Superior | 6,083,057 | ..... | 553 | 35,816 | 92,375 | 117,089 |
| Duluth | 11,220,218 | 8,807,559 | 4,649,611 | 5,356,473 | 5,598,408 | 3,437,955 |
| Total by lake | 37,513,595 | 33,476,904 | 21,226,664 | 23,649,550 | 27,039,169 | 20,157,522 |
| Total by rail | 1,008,544 | 876,552 | 596,175 | 640,328 | 531,952 | 436,015 |
| Total shipments | 38,522,139 | 34,353,456 | 21,822,839 | 24,289,878 | 27,571,121 | 20,593,537 |

Production by Mines.

MESABI RANGE.

| Mine. | Gross tons. 1906. |
|---|---|
| Adams | 1,238,350 |
| Adriatic | 3,294 |
| Agnew | 163,260 |
| Ajax | 9,057 |
| Albany | 356,371 |
| Alexander | 60,547 |
| Bessemer | 131,791 |
| Biwabik | 807,374 |
| Brunt | 75,401 |
| Burt | 1,377,066 |
| Cass | 65,961 |
| Chisholm | 379,156 |
| Cincinnati | 1,373 |
| Clark | 274,394 |
| Commodore | 263,401 |
| Corsica | 100,606 |
| Crosby | 115,373 |
| Croxton | 162,533 |
| Cyprus | 192,144 |
| Duluth | 158,336 |
| Elba | 255,580 |
| Fayal | 1,634,853 |
| Forest | 41,647 |
| Franklin | 66,935 |
| Frantz | 11,068 |
| Genoa | 179,468 |
| Glen | 279,424 |
| Hawkins | 294,588 |
| Hector | 37,221 |
| Higgins No. 2 | 341,319 |
| Hobart | 975 |
| Holland | 95,472 |
| Hull | 282,592 |
| Hull-Rust | 1,690,311 |
| Iroquois | 190,971 |
| Jennings | 84,715 |
| Jordan | 110,768 |
| Kinney | 57,691 |
| La Belle | 50,466 |
| Larkin | 12,031 |
| La Rue | 175,670 |
| Laura | 138,001 |
| Leetonia | 308,989 |
| Leonard | 254,368 |
| Lincoln | 367,192 |
| Mahoning | 1,274,232 |
| Malta | 115,763 |
| Mayas | 107,244 |
| Miller | 234,071 |
| Minorca | 155,541 |
| Mohawk | 92,715 |
| Monroe | 310,839 |
| Morris | 1,809,743 |
| Morrow | 64,073 |
| Mtn. Iron | 2,536,249 |
| Myers | 228,451 |
| Pearce | 66,386 |
| Pettit | 82,757 |
| Pillsbury | 33,546 |
| Rust | 284,517 |
| Sellers | 241,031 |
| Shenango | 383,717 |
| Sparta | 235 |
| Spruce | 674,602 |
| St. Paul | 24,230 |
| Stevenson | 1,014,500 |
| Susquehanna | 20,984 |
| Tener | 174,309 |
| Troy | 146,849 |
| Union | 20,691 |
| Utica | 268,281 |
| Victoria | 64,820 |
| Virginia | 5,674 |
| Wacoutah | 6,766 |
| Webb | 165,604 |
| Williams | 17,685 |
| Winifred | 3,415 |
| Yates | 265,289 |
| Total | 23,792,782 |

VERMILLION RANGE.

| Mine. | Gross tons. 1906. |
|---|---|
| Chandler | 318,990 |
| Pioneer | 766,853 |
| Savoy | 106,933 |
| Sibley | 271,496 |
| Soudan | 146,503 |
| Zenith | 181,580 |
| Total | 1,792,355 |

GOGEBIC RANGE.

| Mine. | Gross tons. 1906. |
|---|---|
| Anvil | 79,493 |
| Ashland | 341,841 |
| Atlantic | 97,689 |
| Brotherton | 147,281 |
| Cary | 216,992 |
| Castile | 2,108 |
| Colby | 113,001 |
| Eureka | 37,525 |
| Harmony | 9,436 |
| Hennepin | 5,768 |
| Iron Belt | 3,227 |
| Ironton | 106,158 |
| Mikado | 154,043 |
| Montreal | 139,202 |
| Newport | 549,745 |
| Norrie Group | 1,244,468 |
| Ottawa | 57,219 |
| Palms | 5,622 |
| Pike | 17,934 |
| Sunday Lake | 86,879 |
| Tilden | 169,697 |
| Yale | 56,657 |
| Total | 3,641,985 |

MENOMINEE RANGE.

| Mine. | Gross tons. 1906. |
|---|---|
| Antoine | 195,855 |
| Aragon | 431,000 |
| Armenia | 27,882 |
| Baltic | 186,495 |
| Breen | 21,004 |
| Bristol | 298,031 |
| Caspian | 80,875 |
| Calumet | 15,773 |
| Chapin | 943,425 |
| Commonwealth | 6,346 |
| Crystal Falls | 111,871 |
| Dunn | 91,476 |
| Eleanor | 3,121 |
| Florence | 169,459 |
| Genesee | 80,971 |
| Great Western | 311,218 |
| Hemlock | 106,437 |
| Hiawatha | 20 |
| Hilltop | 7,820 |
| Lamont | 89,980 |
| Lincoln | 5,890 |
| Loretto | 140,390 |
| Michigan | 146 |
| Millie | 36,815 |
| Munro | 47,454 |
| Nanaimo | 91,792 |
| Paint River | 28,321 |
| Penn Iron Mining Co. | 496,582 |
| Pewabic | 493,891 |
| Riverton | 161,704 |
| Saginaw | 21,017 |
| Tobin | 235,867 |
| Vivian | 122,577 |
| Youngs | 47,583 |
| Total | 5,109,088 |

MARQUETTE RANGE.

| Mine. | Gross tons. 1906. |
|---|---|
| American | 419 |
| Bessie | 1,646 |
| Breitung-Hematite No. 2 | 38,671 |
| Cambria | 40,628 |
| Champion | 115,007 |
| Cleveland Cliffs Group | 1,330,944 |
| Hartford | 364,801 |
| Imperial | 5,076 |
| Jackson | 5,066 |
| Lake Angeline | 269,116 |
| Lake Superior | 635,671 |
| Lillie | 32,781 |
| Lucy | 85 |
| Magnetic | 292 |
| Mary Charlotte | 257,088 |
| Negaumee | 253,448 |
| Palmer | 13,131 |
| Princeton | 166,894 |
| Queen | 221,096 |
| Republic | 177,220 |
| Richmond | 89,563 |
| Volunteer | 38,544 |
| Total | 4,057,187 |

MISCELLANEOUS.
(In Wisconsin)

| Mine. | Gross tons. 1906. |
|---|---|
| Iron Ridge | 61,624 |
| Illinois | 67,118 |
| Total | 128,742 |
| Grand Total | 38,522,139 |

bic range that next year's shipment will be in excess of the 3,641,985 tons produced this year, though, in all probability the percentage of the entire shipment which the Gogebic ore constitutes in 1906, 8.9 per cent, as compared with 10.85 per cent of 1905, will not be larger.

The Menominee range increased its output, approximately, one-half million tons in the past year over 1905, and saw the return to the ranks of producing mines, the old Perkins property now known as the Saginaw, which had not been operated since 1895. The only notations necessary are in connection with the Antoine mine, equally well known as the Clifford or Traders, the old Appleton, recently acquired by the Loretto Iron Co., now known as the Eleanor, and the Paint River mine, from which some shipments are designated Fairbanks.

On the Marquette range the past year witnessed a slight falling off in the amount of ore shipped, due in part to labor difficulties and also to a large amount of effort spent in development work. The old American mine, belonging to M. A. Hanna & Co., which has not shipped any ore for 12 years, was operated in 1906, though it produced only 419 tons, all of which was shipped all rail. In explanation of the list as it will appear in our chart, it may be said that the Blue mine now ships as the Queen and the old Rolling Mill property is known as the Chester. As usual, the Morrow, Cliffs Shaft, Lake, Salisbury, Ogden and Austin mines are reported as the Cleveland Cliffs group. The Marquette range produced of the total shipments 10.5 per cent, as compared with 12.38 per cent in 1905.

The largest single producer, as in 1905, was the Mountain Iron on the Mesabi range, which produced 2,536,249 tons, instead of the 3,000,000-ton output which was variously estimated early in the season. The significant feature about this year's shipments is undoubtedly the large amount shipped all rail. There seems to be no other reason for this where ore is brought to other points than Duluth or Milwaukee by this method than that the unloading facilities at receiving ports have been insufficient to care for the lake shipments. The new facilities now being erected will tend to decrease the all rail shipments in 1907.

---

During the past five years South Africa has expended $50,000,000 on new machinery. The total value of the machinery in the country at the present time is estimated at no less than $150,000,000.

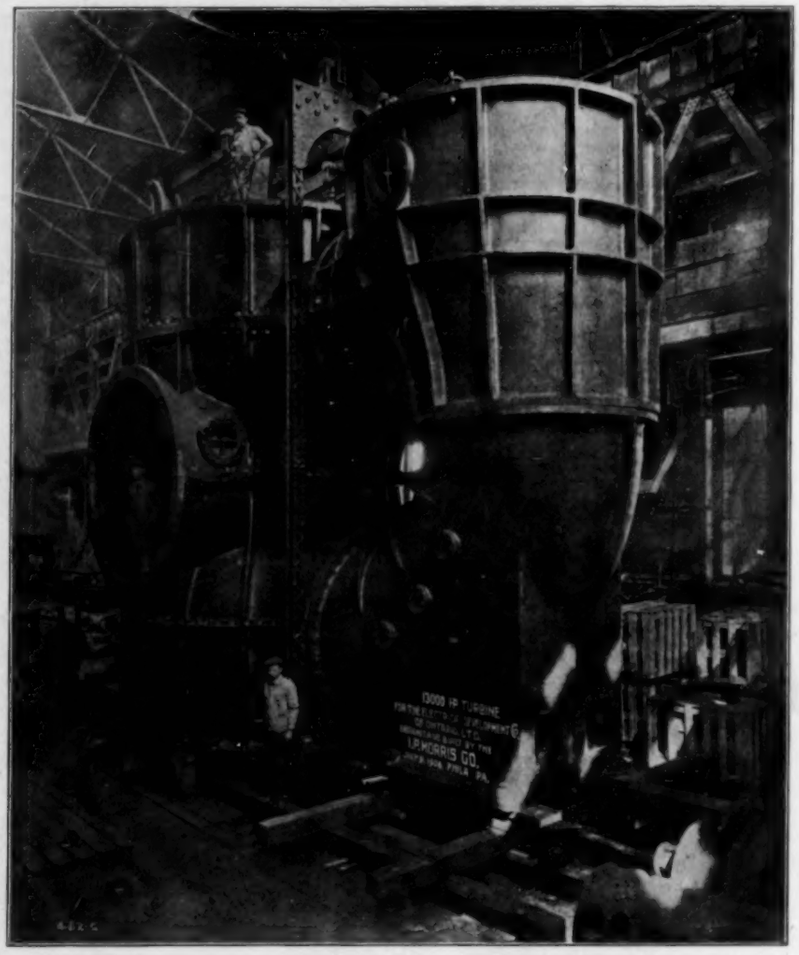
---

The St. Louis Car Co. is completing forty steel cars for the New York subway. Shipments will begin in a few days.

## THE LARGEST WATER TURBINE EVER BUILT.

The accompanying illustration shows the largest water turbine ever constructed. This wheel was made by the I. P. Morris Co., Philadelphia, for the Electrical Development Co. of Ontario, Ltd., and will be used at the Niagara Falls power station of that company. The machine illustrated is one of four similar units, two of which are now in operation, while the other two are being rapidly erected. Each turbine will develop 13,500 horsepower when operating under a head of 135 feet of water, and when running at a speed of 250 revolutions per minute. This turbine is a double unit of the vertical type, the water flowing down on to the upper wheel and from below up through the lower wheel. The thrust of the two wheels is thus balanced, and the thrust bearing has to carry only the weight of the wheels and shafting. The waste water is discharged through a draft tube nine feet diameter. The water enters through two elbows, each seven feet six inches diameter, being led to these elbows by a penstock, 11 feet diameter. The wheel casing was cast in eight sections, four of which weigh about 160,000 pounds, and the other four 120,000 pounds. The two elbows weigh, approximately, 100,000 pounds. The revolving portions, including the turbine runners and the shaft, weigh about 240,000 pounds.

Each unit will drive a 10,000-kilowatt three-phase, 25-cycle generator.




13,000-Horsepower Turbine for Niagara Falls.

---

**Machinery a Fixture.**—The highest court in Germany, the Reichsgericht, has lately in a number of cases held that machinery when installed in a factory or manufacturing plant becomes a fixture, and that therefore a sale upon condition that the title remain in the seller until the machinery is paid for or the lien of the vendor on the goods sold must give way, in case of the bankruptcy of the buyer, to the rights of his creditors, and the machinery becomes part of the assets of the bankrupt. The rights of the holders of mortgages on the plant therefore have precedence over the rights of the seller of the machinery, no matter on what terms the sale was made.

## REAL STATE OF TRADE

### Disclosed in a Report to a British Board of Trade.—Ironmasters Honored.

(Special Correspondence.)

Birmingham, Eng., Feb. 5.—Useful light on the real state of trade is furnished by the return just issued under the North of England wages board of prices and output during November and December. As compared with the same months of the previous year, the output for rail bars, plates and angles was 11,344 tons, against 13,091 tons a year ago, but taking the whole year, there is only a fall of about 100 tons. The total production by the firms under the board was 70,893 tons. All the descriptions of manufacture show a decline on the September-October returns, except rails, which have doubled in quantity. The net average rate was £6-14-11d.26, or an increase of 2½ shillings on September and October, bars being principally responsible for the increase. The average price shows an advance of 11s. 5d. upon the year, but the main point of interest at present is that, though for the whole year there was an increase of 7½ per cent in the wages of iron workers, the present returns carry no advance.

In the Midlands this return will be regarded with great interest. It was assumed there would be at least a 2½ per cent advance in wages. As this has not taken place there is a possibility that the wages disparity between the two districts may now be corrected. This has previously been referred to in this column. Midland iron workers ought to be getting 5 per cent more wages than they are to maintain the correct relationship with the North of England. The recovery of prices in this district was so decided at the end of the year that the Midland wages board return, ought to give the Midland men the desired 5 per cent. If this should take place, the change will be welcomed by the employers, who are not at all satisfied with an unnatural condition of affairs, which causes discontent among their men, and tempts them to migrate northwards in search of better remuneration.

Mr. Whitwell, of Thornaby, who has been president of the northern board of conciliation and arbitration for about 30 years, has been unanimously elected referee in the place of the late Sir David Dale, and Mr. Thackeray, of Mont Wearmouth, was elected to succeed him as president.

Midland ironmasters have been before the public a good deal lately in connection with the banks, and certain interesting public matters. The Birmingham district and counties bank has almost an ironmasters' directorate. Sir James Smith has for his colleagues, G. H. Claughton, the well-known agent for Lord Dudley; E. C. Keay, representing the Birmingham and Willenhall firms of E. C. and J. Keay, Ltd., and G. Macpherson, chairman of the Midland iron and steel wages board, and a prominent figure in some of the most important Black country undertakings. This bank made a net profit of £13,449 and paid a dividend for the year of 15 per cent.

#### Important Advisory Board

Remarkable compliments to leading ironmasters have been paid in the establishment of an advisory board of business men to co-operate with the professors of the Birmingham faculty of commerce at the university. The university council has taken this step so as to bring the university into closer touch with actual business operations. The board comprises the following:

Neville Chamberlain, son of Joseph Chamberlain, of Elliott's Metal Co.

G. H. Claughton, agent of the Earl of Dudley, director of the London & North-Western Railway Co., of the Birmingham District and Counties Banking Co., of the Birmingham Canal Navigation, of the South Staffordshire Waterworks Co., of the South Staffordshire Mond Gas Co., of the Round Oak Works, etc.

F. Dudley Docker, chairman of the Metropolitan Railway Carriage & Wagon Co., managing director of Docker Bros., director of Birmingham Small Arms Co.

A. H. Gibson, director of John Shannon & Co., of the Lanchester Motor Co., of W. & T. Avery, of John & Edwin Wright, member of the firm of Gibson & Ashford, chartered accountants, etc.

Edward Hickman, son of Sir Alfred Hickman, joint managing director of Alfred Hickman, chairman of the Midland Press, director of Broughton Solway Coke Co., of the Midland Railway Carriage & Wagon Co., and of Tarmac, Wolverhampton.

W. E. Hipkins, managing director of W. & T. Avery, director of the Birmingham Small Arms Co., of John & Edwin Wright.

J. S. Taylor, chairman of the council of the Birmingham chamber of commerce, chairman of Taylor & Challen, director of the Rudge-Whitworth Co., of the Lanchester Motor Co., of the Midland Employes' Mutual Assurance, of the Central Insurance Co.

T. Sidney Walker, managing director of Thomas Walker & Son, of the Birmingham Metal & Munitions Co.

The board has been created in the first instance for a period of two years, and its work is to be experimental. But there is every probability that it will be extended. Americans will be interested in knowing that suggestions for this step have been taken from, among other universities, those of Wisconsin, Michigan, and California, which are reported here to be growing every year in strength and reputation.

As the result of a conference between employers and workmen engaged in the South Wales steel trade, the former have agreed to concede an eight hours working day in the trade, and at the same time they have arranged that the lower paid men shall not suffer in pay through the reduction of hours. The decision affects 3,000 men, and will involve a great addition to the number of men employed, increasing the wage sheet £10,000 a year.

#### Prosperity of Tin Plate Trade.

A remarkable report has been issued on the Welsh tin-plate trade by Sim & Coventry, in which after expressing satisfaction with the rise in price from 12s. 9d. at the beginning of the year to 15s. in December, they say:

"As far as tin plates are concerned, we are undoubtedly developing the markets of the world to an extent that the previous generation never anticipated. We still have to fight against tariffs, and are likely to do so for many years to come. There is no gainsaying the fact that since the advent of the McKinley tariff the Welsh tinplate trade has developed into a much sounder condition. We do not suggest that this is solely a case of cause and effect, but it is certainly an example of what can be done by a trade that is alive to the importance of modernizing and keeping up to date its means of production, and where the workmen recognize their responsibility to get the best possible results from the plant. In this connection it is worth noting that the first electric rolling mill to be operated in any tin-plate works in the world has been installed in Monmouthshire during the last fifteen months."

The air is full of reports of big iron enterprises. One of the largest is the purchase of the "Fairplay" iron mine in the Forest of Dean by a syndicate. Other properties are under negotiation, the object of which is said to acquire quite seven miles of ore-bearing land of great value. It is the intention of the new owners to set about the erection of blast furnaces. As there are good railway facilities to the ports, this may turn out a very important development.

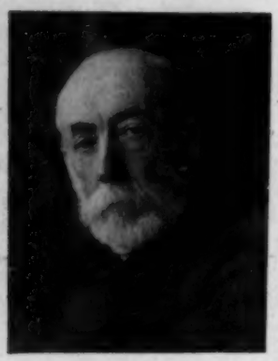
---

**Million for Rensselaer.**—Technical schools have been the recipient of extensive gifts announced during the past week. Mrs. Russel Sage has given the Rensselaer Polytechnic Institute, Troy, N. Y., $1,000,000 for the founding of a department to be named in memory of her husband. The Sheffield Scientific School, Yale, has received $22,000 from John Hays Hammond of New York, for additional laboratory equipment.

## BRITISH IRONMASTER

### Highly Honored by His Friends.—A Notable Presentation.

Birmingham, Eng., Feb. 5.—One of the surprises of the last general election was the rejection of Sir Alfred Hickman, for many years the popular member for the west division of Wolverhampton (England), who was defeated by T. F. Richards, an almost unknown labor candidate. It is known that Sir Alfred felt his rebuff rather keenly, and by way of letting him know that the election did not represent the feeling of the general body of citizens of Wolverhampton, a fund was immediately opened with the object of making him a handsome presentation. This ceremony took place in the Drill Hall, Wolverhampton, on Jan. 29, in the presence of a large crowd of friends, when Sir Alfred was made the recipient of an address, and a valuable service of silver plate. The address, designed by J. J. Brownsword, head master of Wolverhampton School of Art, was enclosed in a silver repousse frame, pierced and inlaid with pearl shell, the whole being mounted on a background of dull mahogany. The design was based on the "honesty plant." Some of the seed vessels were in repousse, while others were in pearl shell. In the center of the upper part of the frame were Sir Alfred's arms in translucent enamel and gold. On the left was the motto, "He sits high in all the people's hearts," and on the right, "It will be a joy to us to recall this some day." The lower portion of the design consisted of a group of "Honesty" supporting the address. The address itself was on vellum, richly illuminated in colors and embossed gold.



SIR ALFRED HICKMAN.

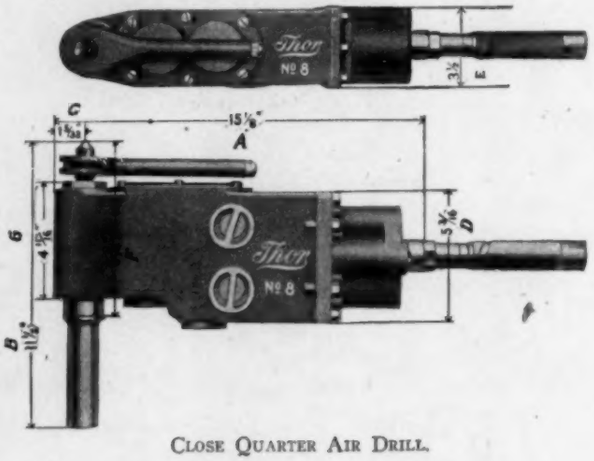
The address, which was highly complimentary, expressed the admiration of political friends and supporters in the various divisions of the district comprising west, east and south Wolverhampton, and the parts of Kingswinford division adjacent to the above. In addition to appreciation for Sir Alfred's strenuous support of Conservative and Unionist principles, acknowledgement was expressed of his "generous pecuniary help, wise councils, and untiring energies, which throughout his long political career had established a further and lasting claim upon their esteem and gratitude." The fund was subscribed to by 4,226 persons.

The gathering was presided over by Lord Dartmouth, who was accompanied by the Countess of Dartmouth, Lady Joan Legge, H. Staveley Hill, M. P., Colonel McBean, and a number of well-known ironmasters. A remarkable tribute was paid by Lord Dartmouth, who made the presentation.

Sir Alfred Hickman returned his warmest thanks to those who had subscribed to the presentation. He said that in all his parliamentary career he had never given a vote nor advocated a policy that was not designed to benefit the great masses of the people.

## CLOSE QUARTER AIR DRILL.

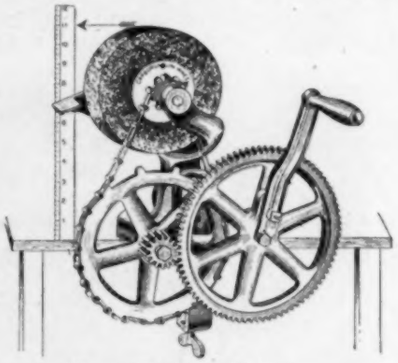
The Independent Pneumatic Tool Co., Chicago, has just placed on the market a new drill, designed for drilling in close quarters and corners where the ordinary drill, with facility, cannot be used. The machine is illustrated herewith. It is known as the Thor No. 8 close quarter piston air drill and is capable of drilling up to 2½ inches in diameter in any kind of metal. The manufacturer bases the superiority of the drill on the ease with which it can be handled and operated, particularly its adaptability in close and cramped quarters, and the fact also that it is of very substantial construction, with no delicate mechanical parts. The distance from the throttle connection of the drill to the outside of the spindle case is 15⅝ inches, and from the point of feed screw to end of socket 11½ inches. The radius from center of feed screw to outside of case is 1 5-32 inches, and the distance from point of feed screw to end of spindle 6¾ inches. The case at cylinder flanges is 5 3-16 inches wide and at the spindle is 4 11-16 inches wide, while the thickness of the outside of case is 3½ inches.




CLOSE QUARTER AIR DRILL.

## A POWERFUL HAND GRINDER.

The Electric Diamond Machine Co., 123 Liberty street, New York, has placed on the market a strong hand grinding machine particularly adapted for outside construction work. The grinder, which is portable, is built along sturdy lines, the main gear being eight inches diameter and the teeth being one inch face. The shaft of the main gear is five-eighths of an inch diameter and has a three-inch bearing. The crank has a fourteen-inch sweep, giving ample leverage for heavy work. All bearings are provided with overhanging lips, thus making them practically dust-proof. A speed of 3,000 revolutions per minute can be maintained without difficulty, owing to the high gearing of the machine. Three wheels are carried, of coarse, medium and fine grit; two of these will go on the shaft at the same time, thus saving the trouble of shifting. The machine also has a twist drill attachment for grinding twist drills and a drill chuck can also be used. Carborundum wheels are employed and the machine is constructed with a malleable frame, which in connection with its powerful lines obviates any danger of breakage. It is made in various sizes.



HAND GRINDING MACHINE.

The Groveland mine, idle for two years, is to be explored by the Huron Iron Co.

# Professional Trading Boosts Stock Prices.

From different points of view, the situation in the stock market during the past week has been both encouraging and disappointing. The extensive liquidation which followed the disappointment of the failure of active demand in the January market seems to have been completed for the present at least. The market, relieved by the elimination of vulnerable accounts held for a rise, has shown gains in many securities during the week, and the general tone has been the most hopeful of any time during the new year. On the other hand, the discouraging features of the market's state comes in the fact that the trade has been almost entirely professional, the investing public appearing to be loathe to do any buying until the future is more definitely indicated by current conditions. The situation in the money market is a good deal mixed. The effect of the government withdrawals of deposits from the national banks will be thrown over into next week's bank statement. The time money market while nominal at the close of the week, was reported stronger and money brokers expect higher rates next week. The weekly bank statement presents an unusually favorable feature on the heavy decrease of over $7,250,000 in loans and the contraction of over $8,000,000 in deposits. These more than offset the loss of nearly $1,000,000 in cash and still show a gain of $1,000,000 in surplus reserve. The latter item is now about $4,500,000, as compared with $5,750,000 a year ago. Trading in the New York exchange during 1907 and up to the present time has aggregated 32,224,800 shares, as against 51,921,100 shares for the corresponding period in 1906. Important financial developments of the week have been placing of $28,000,000 15-year bonds abroad by the New Haven railroad, and the announcement that more than $10,000,000 of the three year 5 per cent notes of the Interborough Rapid Transit Co., have been sold by the syndicate which took them.

**Financial Notes:—**

The Lackawanna Steel Co. has issued $5,000,000 two-year 5 per cent notes to a syndicate, and the proceeds are to be used in part payment of the Ellsworth Coal properties, and for construction work and improvements now in hand covering the next two years.

The Herring-Hall-Marvin Safe Co.'s annual report for the year ending Dec. 31, 1906, shows that the actual net profits before charging off for depreciation, were $102,048. A special reserve fund of $11,000 against possible uncollectible accounts in San Francisco has been appropriated; $31,665 has been set aside for depreciation and $18,159 was charged to expense upon maintenance.

The Sloss-Sheffield Steel & Iron Co. has declared a dividend of 1¼ per cent on the common stock, payable March 1. Hereafter the company will make quarterly instead of semi-annual payments on this stock. Other dividends declared include the following: Barney & Smith Car Mfg. Co., quarterly dividend of two per cent on preferred stock, and one per cent on common stock; J. A. Fay & Egan Co., a quarterly payment of 1¾ per cent on common stock, increasing the annual rate from six to seven per cent, and the regular quarterly dividend of 1¾ per cent on the preferred stock, both payable Feb. 20; the Wheeling Steel & Iron Co., regular quarterly dividend of two per cent.

## THE LEADING INDUSTRIAL SECURITIES.

| | Closing Quo. Feb. 16 | Changes In Week | Date 1907 Ann. Meet. | Stock Outstanding | Dividend Basis | Dividend Being Paid | Date Last Div. Pay. |
|---|---|---|---|---|---|---|---|
| Allis-Chalmers | 14¾ | — ¼ | Sept. | 19,820,000 | | | |
| Allis-Chalmers pr | 38 | | | 16,150,000 | 7 cum | | Feb., 1904 |
| American Can | 6⅝ | + ⅛ | Feb. 5 | 41,233,300 | | | |
| Am. Can pr | 54⅛ | + ⅜ | | 41,233,300 | 7 cum | 5 Q. | Jan., 1907 |
| Am. Car and Fdy | 44½ | + ⅜ | June 27 | 30,000,000 | | ½ Q. | Jan., 1907 |
| Am. Car and Fdy pr | 101½ | —1 | | 30,000,000 | 7 n. c. | 7 Q. | Jan., 1907 |
| American Loc | 74⅞ | +1 | Oct. 5 | 25,000,000 | | 1¾ | Feb., 1907 |
| American Loc. pr | 110½ | | | 24,100,000 | 7 cum | 7 Q. | Jan., 1907 |
| American Ship | 77 | —1 | Oct. 2 | 7,600,000 | 6 | 1 Q. | Dec. 1906 |
| American Ship. pr | 108¼ | | | 7,800,000 | 7 n. c. | 1¾ Q. | Jan. 1907 |
| Am. Steel Foundries | 9⅝ | | Oct. 1 | 15,810,000 | | | |
| Am. Steel Foundries pr. | 43¾ | | | 17,240,000 | 6 cum | | Aug., 1904 |
| Barney & Smith | 71 | | June 4 | 2,000,000 | 4 | 4 | Mar., 1907 |
| Barney & Smith pr | 138 | | | 2,500,000 | 8 cum | 8 Q. | Mar., 1907 |
| Bethlehem Steel | 18½ | | April 2 | 14 862,000 | | | |
| Bethlehem Steel pr | 56 | | | 14,908,000 | 7 n. c. | 5 Q. | Feb., 1907 |
| Cambria Steel | 45⅝ | | Mar. 19 | 45,000,000* | 6 | 3 Q. | Feb., 1907 |
| Cambria Iron | 48 | | | 8,468,000* | 4 | 4 S. A. | Oct., 1906 |
| Chicago Pneumatic Tool | 47 | | Feb 18 | 6,145,800 | 4 | 4 Q. | Jan., 1907 |
| Colorado Fuel | 49⅞ | +1⅛ | Oct. 21 | 30,132,000 | | | Apr., 1902 |
| Crucible Steel | 10⅞ | — ⅛ | Oct. 16 | 24,578,400 | | | |
| Crucible Steel pr | 79 | +1⅛ | | 24,436,500 | 7 cum | 6 | Dec., 1906 |
| Empire Steel | 5 | | Feb. 27 | 2,281,400 | | | |
| Empire Steel pr | 47 | | | 2,500,000 | 6 cum | 3 S. A. | July, 1906 |
| Fay & Egan | 95 | | Feb. 19 | 1,000,000 | 6 | 7 Q. | Feb., 1907 |
| Fay & Egan pr | 128½ | | | 1,000,000 | 7 cum | 7 Q. | Feb., 1907 |
| General Electric | 160 | — ¾ | May 14 | 63,643,600 | 8 | 8 Q. | Jan., 1907 |
| Harbison-Walker | 12½ | | Jan. 21 | 18,000,000 | 6 | | |
| Harbison-Walker pr | 74 | —1 | | 9,600,000 | 6 cum | 6 Q. | Jan., 1907 |
| International Pump | 35¾ | | June 4 | 17,762,500 | | 2 | Apr., 1905 |
| International Pump pr | 80 | + ¾ | | 11,850,000 | 6 cum | 6 Q. | Feb., 1907 |
| Lackawanna Steel | 60 | | Mar. 13 | 34,971,400 | | | |
| Lake Sup. Corp | 14½ | | Oct. 2 | 40,000,000 | | | |
| New York Air Brake | 138 | | June 18 | 10,000,000 | 8 | 8 Q. | Jan., 1907 |
| Niles-Bement-Pond | 130 | | Feb. 6 | 5,000,000 | 6 | 6 Q. | Mar, 1907 |
| Niles-Bement-Pond pr | 105 | | | 2,000,000 | 6 cum | 6 Q. | Feb., 1907 |
| Otis Elevator Co | 48 | —2 | March 18 | 6,350,300 | | 2 A. | Apr., 1906 |
| Otis Elevator Co. pr | 94 | | | 6,308,500 | 6 n. c. | 6 Q. | Jan., 1907 |
| Penn. Steel | 62 | —5 | May 13 | 10,750,000 | | | |
| Penn. Steel pr | 104 | | | 16,500,000 | 7 n. c. | 7 S. A. | Apr., 1906 |
| Pittsburg Coal Co | 16 | | Feb. 11 | 32,000,000 | | | Nov. |
| Pittsburg Coal pr | 58⅛ | — ⅜ | | 32,000,000 | 7 | | Apr., 1905 |
| Pressed Stl. Car | 52¾ | +2¼ | Feb. 20 | 12,500,000 | | 3 | Aug., 1904 |
| Pressed Stl. Car pr | 98 | — ⅛ | | 12,500,000 | 7 n. c. | 7 Q. | Feb. 1907 |
| Pullman | 171¾ | +8⅝ | Oct. 17 | 100,000,000 | 8 | 8 Q. | Feb., 1907 |
| Railway Stl. Spring | 53⅞ | + ¼ | Mar 7 | 13,500,000 | | 4 S. A. | Oct., 1906 |
| Railway Stl. Spring pr | 99½ | + ⅛ | | 13,500,000 | 7 cum | 7 Q. | Dec. 1906 |
| Rep. Iron & Steel | 38¼ | + ⅛ | Oct. 9 | 27,191,000 | | | |
| Rep. Iron & Steel pr | 99 | + ⅜ | | 20,416,900 | 7 cum | 7 Q. | Apr., 1907 |
| Sloss-Sheffield | 72¾ | +1¾ | Mar. 5 | 10,000,000 | 5 | 5 Q. | Oct., 1906 |
| Sloss-Sheffield pr | 103 | | | 6,700,000 | 7 n. c. | 7 Q. | Jan , 1907 |
| Tenn. Coal & Iron | 150 | —5½ | May | 22,553,600 | 4 | 4 Q. | Feb., 1907 |
| U. S. Pipe & Fdy | 46⅞ | +1¾ | June 26 | 12,500,000 | 4 | 4 Q. | Dec., 1906 |
| U. S. Pipe & Fdy. pr | 86⅜ | — ⅝ | | 12,500,000 | 7 n. c. | 7 Q. | Dec., 1906 |
| U. S. Steel | 46⅝ | +2⅛ | April 15 | 508,302,500 | 2 n. c. | ½ Q. | Mar., 1907 |
| U. S. Steel pr | 105⅛ | + ⅝ | | 360,281,100 | 7 cum | 7 Q. | Feb , 1907 |
| U. S. Steel 5's | 99 | | | 463,798,000 | 5 | 5 A. | |
| Va. Iron, Coal & Coke | 87½ | | Sept. 17 | 8,641,600 | | | |
| Westinghouse Elec | 150 | | June 26 | 20,996,350* | 10 | 10 Q. | Jan., 1907 |
| West'ghouse Air Brake | 156 | | Oct. 1 | 11,000,000* | | 22½ Q. | Jan. 1907 |

Par value of shares, $100, except those starred, $50.

The recent decision of the American Brass Co., to increase its capitalization from $12,500,000 to $15,000,000 has been followed by similar action by a number of independent companies as follows: Scovill Mfg. Co., Waterbury, Conn., $3,250,000 to $4,262,500; Waterbury Mfg. Co., $100,000 to $500,000; American Tin Co., Waterbury, Conn., $200,000 to $300,000; Bristol Brass Co., Forrestville, Conn., $500,000 to $700,000.

# NEWS FROM MANY INDUSTRIES.

**New Buyers:—**

The Fairbanks Steam Shovel Co., Marion, O., has increased its capital stock from $200,000 to $275,000.

The Nutting Machine Co., Dayton, O. has been organized by Frederic J. Nutting, Frank T. Huffman, Clifford Cassingham, Louise M. Schaefer, and Jesse L. Kepler. The capital is $50,000.

The Atlas Laundry Machinery Co., Cincinnati, O., has been incorporated with a capital of $100,000 by Frank W. Watkins, Joseph Wolf, Chas. S. Hisey, Paul H. Hesser, Chas. F. Klein and W. J. Davidson.

The Modern Foundry Co., Oakley, O., has been chartered by Fred A. and P A. Geier, C. Wood, Walter and Charles S. Gingrich. The company will erect a model foundry to supply castings to a group of manufacturers to be grouped in the new factory colony at that place.

The Maag-Wahmann Co., Baltimore, Md., has been organized to manufacture sheet metal goods, by August Maag, George H. Wahmann, Louis Rosenfeld, James M. Decker and Mary Maag.

The North Wales Machine Co., North Wales, Pa., has been formed to manufacture machinery. James W. King, Philadelphia, is president.

The Mummert, Wolfe & Dixon Co., Hanover, Pa., has been incorporated to manufacture machinery. E. S. Wolfe, Hanover, is treasurer.

The Keystone Sheet Metal Co., Ambridge, Pa., has been incorporated to manufacture sheet metal. F. C. Schweder, Ellsworth, is treasurer.

The Erie Tool Works, Erie, Pa., has been organized to make tools and machinery. F. W. Bacon, Erie, is president.

The Fuller Brake Co., Picture Rocks Pa., has been organized to manufacture brakes and car appliances. Peter H. Fuller, Picture Rocks, is treasurer.

The Acme Foundry Co., Pittsburg, has been incorporated with Edward Oberndorf as president.

The Kensington Engine Works, Philadelphia, has been formed to manufacture stationary and motor boat machinery. C. P. Francis, of Philadelphia, is treasurer.

The Greenmount Smelting & Refining Co., Philadelphia, has been incorporated. W. E. Ridenour is president.

The California Tool Works, California, Pa., has been organized to manufacture tools. E. H. Morgan, California, is president.

The Pittsburg Steel Cooperage Co., Pittsburg, has applied for a Pennsylvania charter. O. C. Orens, F. F. Bollinger, C. J. Tope, S. W. Bollinger and S. P. Cessna are applicants.

The Chadwick Engineering Works, Philadelphia, has applied for a state charter to manufacture machinery and castings for motor boats and cars. R. O. Moor is interested.

The American Rail Joint Co., Niagara Falls, N. Y., has been incorporated with a capitalization of $750,000 by M. Cohn Jr., F. Charmann, F. G. Anderson, A. Killiaw, H. Charmann, all of that address. Rails, rail joints, angle bars, etc., will be manufactured.

The Myers Track Tool Co., Buffalo, has been incorporated for $1,000,000 by C. H. Myers, P. L. Marvin and F. R. Newton, all of Buffalo.

The Pratt Bros. Cutlery Co., Andover, N. Y., has been incorporated with a capitalization of $50,000 to manufacture cutlery. The incorporators include C. W. Platts, J. A. Platts, J. L. Williams and C. L. Harley, all of Andover.

The Globe Mfg. Co., Taunton, Mass., has been incorporated with a capital of $20,000 by J. A. Welch and others. Nails, tacks, rivets, etc., will be manufactured.

Smith & Loughlin, Brooklyn, have incorporated their iron foundry business under that name. The capital is $20,000.

Daft, Hayward & Co., Pittsburg, have applied for a charter to deal in iron and steel, ore, coal, coke, manganese, etc. A. C. Daft, C. C. Smith and T. R. Hayward, Pittsburg, are interested.

The Vulcan Steel & Iron Co., Philadelphia, has asked for a state charter to manufacture forgings, etc. Clark Cooper, George W. B. Fletcher and J. C. Riley are incorporators.

The Reading Standard Co., Reading, Pa., is seeking a state charter to make castings for motor cars, etc. W. F. Remppis, J. M. Bard and J. B. Fricker, of Reading, are interested.

The National Steel Furnace Co., St. Louis, Mo., has been organized by J. C. Banks, R. E. Mackey, Wm. T. Tipton, C. H. Bishop, and J. B. Eberle, with $30,000 capital, to manufacture heating furnaces.

The Sheet Metal Specialty Co., Chicago, Ill., has been formed with a capital of $10,000, with M. T. Cragg, L. G. Strob and C. L. Cragg as incorporators.

The Galesburg Malleable Castings Co., Galesburg, Ill., has been organized by Dyke Williams, Thos. B. Maiston and W. S. Carson, with a capital of $60,000.

The Blymyer Iron Works Co., Cincinnati, O., has increased its capital from $100,000 to $300,000.

The Belle & Howell Co., Chicago, has been formed with a capital of $5,000 to manufacture and repair machinery. Donald J. Bell, Albert S. Howell and Margaret V. Bell are the incorporators.

The Farrell Foundry & Machine Cos., allied concerns of Waterbury and Ansonia, Conn., respectively, have increased their capital stock. The increase of the Waterbury company is from $400,000 to $440,000, and of the Ansonia company from $1,150,000 to $1,200,000.

The Metallic Sheet & Tube Co. has been granted a Rhode Island charter to manufacture stampings, tubes, rods, shells, etc. The capital stock of the company is $150,000, and the incorporators are: Henry E. Smith, Cranston, R. I.; George B. Champlin, Warwick, R. I., and Leslie E. Hooker, Binghamton, N. Y.

The Hoffman Mfg. Co., Brooklyn, N. Y., has been incorporated to deal in sheet iron, copper, tin, etc. The capital stock is $10,000 and the incorporators are: Fred P. Hoff, Ellridge Hoff Jr., Theodore S. Miller, William G. Stahlnecker and Hebe F. Andrews, all of the above address.

The Wendt Coupler Co., Marshfield, Wis., has been organized with a capitalization of $50,000 to manufacture railroad car equipments. A new steel foundry will be erected and a specialty will be made of a patented coupler, of which Fred H. Wendt is the inventor.

The American Rail Joint Foundry Co. has been incorporated under the laws of New York with an authorized capital of $750,000 for the manufacture and sale of the Williams reinforced angle bar and other track devices. The head office of the company will be established in New York, with representatives at Chicago, New Orleans and other important centers.

---

**New Construction:—**

The New Haven Sheet Iron Co., New Haven, Pa., is preparing to erect a plant for the manufacture of steel mine cars and other mine supplies. One of the specialties of the concern will be a steel pit car. The company has organized by electing the following officers: Dr. G. W. Gallagher, president; John Duggan, vice president; James C. Long, secretary and treasurer, and John Whittaker, general manager.

The Lorain Machine & Forge Co., Lorain, O., has increased its capital stock from $10,000 to $30,000, and is planning the erection of a brass foundry for the manufacture of an oil force pump for automobiles.

The Novelty Iron Works, Sterling, Ill., has contracted for the erection of an addition to its foundry 18 x 50 feet.

Negotiations have been closed with the Young Men's Commercial Club, of Flor-

ence, Ala., whereby the Sheffield Stove Foundry, whose plant was destroyed by fire six months ago, will be rebuilt at once. The company will manufacture a patented steel range.

The Sioux City Foundry & Mfg. Co., Sioux City, Ia., is preparing to erect a plant. The boiler and structural steel shop will be 80 x 100 feet.

The Oostburg Steel Co., Oostburg, Wis., is planning to build a $20,000 steel plant in that village. Peter Doane, the president, will receive bids.

The Champion Machinery Co., Joliet, Ill., reports that its new foundry building will be 60 x 66 feet, with facilities for double this space. Full equipment will be required. The foundry will have a capacity of five tons an hour. The castings will be for the company's own use.

The Detroit Twist Drill Co., Detroit, is preparing plans for a new plant which it will erect on Fort street, west, in that city. The main building will be 120 x 140 feet, three stories in height. The plant will be equipped with the latest labor saving devices and automatic machinery which will be electrically driven. The power will be obtained from a gas engine and producer plant which will be included in the improvements.

The Birmingham Car & Mfg. Co., Birmingham, Ala., recently incorporated, states that it has plans in readiness to start work on its new plant within the next two weeks. The company has purchased 10 acres of ground in North Birmingham, located on the L. & N. R. R., and also on the Birmingham Belt R. R. For the present, business will be devoted exclusively to the manufacturing of mine, logging, contractors' and other small industrial cars. There will be a wheel foundry which will supply the wheels required for the cars. Practically all the equipment has been purchased.

The W. K. Henderson Iron Works & Supply Co., Ltd., Shreveport, La., manufacturing machinery, mill supplies, etc., states that its new building, 90 x 120 feet, is an addition to its machine shop to alleviate present crowded conditions. Only a few machines will be added.

The Beaumont Iron Works, Beaumont, Tex., reports that it is considering the erection of a new brass foundry, as well as an addition to its cast iron foundry and the installing of a boring mill and axle lathe. In the near future the company will begin the erection of a new building 80 x 400 feet, in connection with its car shops.

The George J. Meyer Machinery Co., Milwaukee, Wis., has purchased the plant of the David Brothers Mfg. Co., of that city. The Meyer company manufactures a patented bottle soaking machine and other brewery specialties. Plans for a two-story addition to the Davis plant are now under way and when completed the Meyer company will increase its number of employes.

The Turner Brass Works, Chicago, has broken ground for a new factory at Sycamore, Ill., which it hopes to have in operation about May 1. The new shop will have ample switching facilities and will be 100 x 400 feet. Power and tool equipment have been purchased.

The Wright Wire Co., Palmer, Mass., has decided to enlarge the capacity of its equipment from 3,000 to 4,000 tons per year to meet the increasing demands for its product. A brick addition, two stories high and 160 feet long, will be built in front of the present structure. A 75 x 85 foot brick annealing and cleaning building will also be erected. Other additions are possibilities of the near future.

The Illinois Bolt, Nut & Forging Co., Chicago, recently organized, has elected the following officers: P. H. Joyce Sr., president; Lloyd J. Smith, vice president, and M. L. Hunt, secretary and treasurer. The directors are: P. H. Joyce Sr., Lloyd J. Smith, M. J. McDonough, A. W. Tyler and George Chilton. The offices of the company at present are at 1019, the Temple. Contracts have been let for the buildings and for the largest part of the machinery. The plant is to be operated by electricity and it is expected it will be ready by April 1.

The Berbecker & Rowland Mfg. Co., Waterbury, Conn., has contracted with the Torrington Building Co. for a two-story, 40 x 82 feet, brick addition to its brass foundry.

A new plant 60 x 200 feet will be erected by C. H. A. Dissinger & Bros., Wrightsville, Pa., manufacturers of gas and gasoline engines, to cost $10,000. The power plant will have a capacity of 50 horsepower.

The Lorain Steel Co., Johnstown, Pa., has let the contract for a $200,000 building, in which will be installed the plants for the manufacture of switches, signals and electrical appliances used on street railway systems. It will be 376 by 400 feet, and have a floor space of over 150,000 square feet. It will be absolutely fireproof. The work will be inaugurated as soon as open weather begins.

---

**General Industrial Notes:—**

The buildings of the new plant of the Ohio Mfg. Co., Columbus, O., are completed and the machinery is being installed. The company, which manufactures gas engines, motors and other machinery, is moving to Columbus from Upper Sandusky, O.

Charles E. Cunningham, of Baltimore, in behalf New York interests, has sold to George L. Crawford, of Pittsburg, representing a Pennsylvania syndicate, about 4,000 acres of land in Boone county, W. Va., for $400,000. The new company will be known as the Pennsylvania Coal, Coke & Lumber Co.

The Seamless Steel Bath Tub Co., Detroit, has elected the following directors: Theo. D. Buhl, Jos. Boyer, A. S. Pessano, A. E. F. White, A. B. du Pont, W. P. Stevens, Eugene H. Sloman, Geo. H. Barbour and Geo. D. Russel.

The Lyman Mfg. Co., Buffalo, N. Y., contract manufacturers of metal specialties, states that it has incorporated the company, which has been in existence for a year past. No building is contemplated, but new equipment, mainly brass finishing machinery, is being constantly added. The plant at present consists of machine shop and foundry.

The Globe Iron Co., Menominee, Wis., at its annual meeting re-elected the following directors: T. B. Wilson, J. J. Flather, E. F. Bowesfield, G. A. Chaffey.

The Republic Iron & Steel Co., Youngstown, O., has purchased the site formerly occupied by the Enterprise Boiler Works, near its plant. The purpose to which the land will be put has not yet been announced.

The Ralston Steel Car Co., Columbus, O., is installing the machinery in the new extension of its plant. The capacity of the plant is about 15 cars a day at present and when the extension is in full operation it will turn out from 20 to 25 cars a day. Included in the machinery being installed is an air compressor, a 500-ton hydraulic press, a 400 horsepower motor and a 3 kilowatt generator.

Harry Griscom and Clarence Converse have purchased the main interest of J. E. Price of the Price-Evans Foundry Co., Chattanooga, Tenn. Mr. Griscom has been with the Chattanooga Roofing & Foundry Co. for several years and Mr. Converse was formerly with the same company, but for some time has been with the Price & Evans Co.

At the annual meeting of the Columbus Forge & Iron Co., Columbus, O., W. A. Miller was elected a member of the board of directors to succeed W. D. Brickell, resigned. The other directors were re-elected as follows: Foster Copeland, F. A. Miller, R. S. Warner and D. W. Singleton. The board will reorganize at its next meeting by re-electing the old officers as follows: Foster Copeland, president; F. A. Miller, vice president; and D. W. Singleton, secretary and treasurer.

Practically all of the machinery has been installed in the new plant of the Capitol Lock Nut & Washer Co., Columbus, O., and the company is now operating at almost its full capacity. It is turning out over 20 tons daily at present and when all the machinery is in its

capacity will be from 28 to 30 tons. Besides manufacturing a patent lock nut and washer, the company turns out a great deal of standard stock. The company was incorporated about 18 months ago in New Jersey and was re-incorporated in Ohio last May with a capital stock of $750,000. The capitalization is largely common stock, the majority of which is still unissued, but is lying in the company treasury to be used in future extensions and the erection of plants in other localities. The company has orders already representing its output for almost a year ahead.

The Marceline Steel Co., recently incorporated with a capitalization of $50,000, has opened an office at 632 Park Row Bldg., New York, for the sale of high speed tool steel of British manufacture. Eventually it is expected that a plant will be erected in this country. Marcel Wormsere, of England, is president of the company, C. S. Taylor, vice president, and W. J. Jeandron, secretary, all having been widely connected with the steel industry.

Directors of the American Locomotive Co. held a meeting last week and considered the question of improvements involving the expenditure of about $70,000. A vigorous denial was given the report that negotiations were under way looking to a deal with the General Electric and Westinghouse companies.

The item of $1,400,000 providing for the building of a steel floating dry dock was stricken out of the naval appropriation bill by the house last week.

The New England headquarters of the Philadelphia & Reading Coal & Iron Co. are to be transferred from Boston to Salem, Mass., where extensive dock and railway facilities are to be provided.

**Trade Notes:—**

The Paris & Orleans Co., of France, has specified Falls Hollow Staybolt iron manufactured by the Falls Hollow Staybolt Co., of Cuyahoga Falls, O., for the 20 DeGlehn compound locomotives now being built by the Baldwin Locomotive Works.

The W. P. Davis Machine Co., Rochester, N. Y., announces that it has moved its offices from 130 Mill street, to 257 St. Paul street. In the new quarters a much larger stock of machine tools, engines, boilers, iron and wood working machinery and mill supplies will be handled.

Cohen & Schwartz Rail & Steel Co., St. Louis, Mo., has removed its general offices to suite 508 Mechanics' American Bank building.

W. D. Sargent, 140 Liberty street, New York City, is advertising for sale the business of the Pedrick & Ayer Co., including manufactured goods on hand, patents, patterns, small tools, etc., complete for the manufacture of the firm's line of railway shop tools.

**Fires:—**

The coil department and power plant of the coil and pipe bending department of the Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., was destroyed by fire Feb. 8, entailing a loss of $10,000.

The Wm. Cramp & Sons Ship & Engine Building Co., Philadelphia, Pa., suffered the loss of pattern shops and two storage rooms by fire Feb. 13. Valuable patterns were burned. The loss is estimated at $100,000.

The Janesville Machine Co., Janesville, Wis., was damaged to the extent of $10,000 Feb. 6 by fire in its paint department.

The new plant of the Indiana Foundry & Machine Co., South Bend, Ind., was damaged by fire to the extent of $10,000 Feb. 3.

The Continental Gin Co., Dallas, Tex., sustained a loss of $7,500, Jan. 31, by fire in its foundry department.

The Burnett Drop Forge Works, Easthampton, Mass., was destroyed by fire Feb. 11, with a loss of $30,000.

A loss approximating $50,000 was suffered Feb. 12 by the Fischer Foundry & Machine Co., Kittanning, Pa., when its plant was practically destroyed by fire. Insurance is adequate.

The plant of the Ohio Ceramic Engineering Co., manufacturer of brick making machinery and industrial cars, located just outside the city limits of Cleveland, was destroyed by fire, Feb. 12, entailing a loss of $150,000. As soon as the insurance is adjusted, the plant will be rebuilt practically as it was before the fire.

## KNOWLEDGE NO BAR.

Knowledge by an employe of defective and dangerous machinery shall not bar him recovering damages from an employer for injuries if a bill introduced in the house of representatives of Minnesota by J. W. Stokes, of Minnesota, is adopted. The bill provides that in an action brought by an employe against an employer to recover for personal injury, when it appears that the injury was caused wholly or in part by negligent omission of an employer to guard or protect his machinery or appliances or the premises or place where the employe was employed, the fact that the employe continued in the employment with the knowledge of such omission and in appreciation of the dangers occasioned thereby, shall not operate as a defense to any action to recover for personal injury.

## RAPID GROWTH

### Of the Foundry Supply Association. —Preparing for Philadelphia Exhibit.

During the past few weeks the Foundry Supply Association has enjoyed a rapid growth in membership, eighteen concerns, including foundry supply and equipment dealers and manufacturers, having made application for enrolment. Space in the Second Regiment Armory, Philadelphia, where the exhibit will be held during the week of the convention of the American Foundrymen's Association, is being rapidly allotted and only a small section is still available.

An "Otto" gas engine, which will drive a Crocker-Wheeler generator, has been installed for the exhibitors desiring direct current, while the remainder of the power will be furnished by alternating current motors. One of the many features of the exposition will be the large number of oil melting furnaces which will be shown in the adjoining lot, where the heavier pieces of equipment requiring foundations or pits will be located in temporary structures.

The enrolment of the Foundry Supply Association follows:

Addy & Co., Matthew, Philadelphia.
Arcade Mfg. Co., Freeport, Ill.
Berkshire Mfg. Co., Cleveland.
Bonvillain, Ph. & E. Ronceray, Paris, France.
Borgner Co., Cyrus, Philadelphia.
Buffalo Forge Co., Buffalo.
Byram & Co., Detroit.
Cleveland Wire Spring Co., Cleveland.
Crocker-Wheeler Co., Ampere, N. J.
Detroit Foundry Supply Co., Detroit.
Detroit Testing Laboratory, Detroit.
Dings Electro-Magnetic Separator Co., Milwaukee.
Dixon Crucible Co., Joseph, Jersey City.
Emmert Mfg. Co., Waynesboro, Pa.
Evans Stamping & Plating Co., Taunton, Mass.
Falls Rivet & Machine Co., Cuyahoga Falls, O.
Goldschmidt Thermit Co., New York.
Hanna Engineering Works, Chicago.
Herman Pneumatic Machine Co., Zelienople, Pa.
Hill & Griffith Co., Cincinnati.
Holland Linseed Oil Co., Chicago.
Interstate Sand Co., Cleveland.
Johnston, S. T., Chicago.
Kelley Co., T. P., New York.
Killing Molding Machine Co., Davenport, Ia.
Koppel Co., Arthur, New York.
Lamson, Thos. F., Boston.
Lindsay & Co., W. W., Philadelphia.
Link-Belt Co., Philadelphia.
McCormick Co., The J. S., Pittsburg.
Mills Oil Co., C. E., Syracuse, N. Y.
Mitchell-Parks Mfg. Co., St. Louis.
Mumford Co., The E. H., Philadelphia.
Obermayer Co., The S., Cincinnati.
Osborn Mfg. Co., Cleveland.
Otto Gas Engine Works, Philadelphia.
Pangborn, Thomas W., New York.
Paxson Co., J. W., Philadelphia.
Penton Publishing Co., The, Cleveland.
Pettinos Bros., Bethlehem, Pa.
Pilling & Crane, Philadelphia.
Pridmore, Henry E., Chicago.
Robeson Process Co., Camden, N. J.
Rockwell Engineering Co., New York.
Rogers, Brown & Co., Cincinnati.
Seidel, Inc., R. B., Philadelphia.
Sly Mfg. Co., The W. W., Cleveland.
Smith Foundry Supply Co., The J. D., Cleveland.
Southern Machinery Co., Atlanta.
Standard Sand & Machine Co., Cleveland.
Tabor Mfg. Co., Philadelphia.
U. S. Graphite Co., Saginaw, Mich.
Wells Light Mfg. Co., New York.
Western Foundry Supply Co., East St. Louis, Ill.
Wilbraham-Green Blow - Co., Philadelphia.
Whiting Foundry Equipment Co., The, Harvey, Ill.
Yale & Towne Mfg. Co., New York.